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A Meta-Analytic Review of Achievement Goal Measures: Different Labels for the Same Constructs or Different Constructs With Similar Labels?

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This meta-analysis addresses whether achievement goal researchers are using different labels for the same constructs or putting the same labels on different constructs. We systematically examined whether conceptual and methodological differences in the measurement of achievement goals moderated achievement goal intercorrelations and relationships with outcomes. We reviewed 243 correlational studies of self-reported achievement goals comprising a total of 91,087 participants. The items used to measure achievement goals were coded as being goal relevant (future-focused, cognitively represented, competence-related end states that the individual approaches or avoids) and were categorized according to the different conceptual definitions found within the literature. The results indicated that achievement goal–outcome and goal–goal correlations differed significantly depending on the goal scale chosen, the individual items used to assess goal strivings, and sociodemographic characteristics of the sample under study. For example, performance-approach goal scales coded as having a majority of normatively referenced items had a positive correlation with performance outcomes ($\hat{r} = .14$), whereas scales with a majority of appearance and evaluative items had a negative relationship ($\hat{r} = -.14$). Mastery-approach goal scales that contained goal-relevant language were not significantly related to performance outcomes ($\hat{r} = .05$), whereas those that did not contain goal-relevant language had a positive relationship with performance outcomes ($\hat{r} = .14$). We concluded that achievement goal researchers are using the same label for conceptually different constructs. This discrepancy between conceptual and operational definitions and the absence of goal-relevant language in achievement goal measures may be preventing productive theory testing, research synthesis, and practical application.

Keywords: achievement goals, meta-analysis, motivation, interest, performance

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> [C]onstructs are the central means we have for connecting the operations used in an experiment to pertinent theory . . . [and] mislabelings often have serious implications for theory. (Shadish, Cook, & Campbell, 2002, pp. 65, 71)

> [G]oal is a notoriously ill-defined term in motivation theory. (Heckhausen & Kuhl, 1985, p. 137)

Achievement goal theory has inspired over 1,000 published papers and dissertations in the past 25 years. This work has been guided by a multitude of frameworks (e.g., Ames, 1984; Dweck, 1986; Elliot, 1999; Harackiewicz & Sansone, 1991; Nicholls, 1984; Skaalvik, 1997; VandeWalle, 1997) that generally focus on two facets of goal-directed achievement strivings: mastery (i.e., task orientation, learning, mastery-challenge) and performance (i.e., ego orientation, relative ability, self-enhancement). In narrative reviews, varied theoretical frameworks tend to be viewed as relatively equivalent (e.g., Ames, 1992; Elliot, 2005; Senko, Durik, & Harackiewicz, 2008; Urdan, 1997), and theorists agree that mastery and performance achievement goals represent two different ways of defining competence (Pintrich, 2003). These reviews suggest that mastery goals have a generally positive association with adaptive motivational processes and outcomes, whereas performance goals have a more uneven pattern (i.e., some adaptive, some neutral, and some maladaptive relationships). This apparent agreement in conceptualization is contradicted by several points of conflict and debate within the field. For example, recent controversies over the relationship between performance goals and educational outcomes (cf. Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Midgley, Kaplan, & Middleton, 2001), whether to

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include impression management or normative comparison components in the performance goal construct (Brophy, 2005; Elliot & Thrash, 2002; Grant & Dweck, 2003; Urdan, 1997), and whether to conceptualize achievement goals as broad orientations or more precise goal-focused strivings (Elliot & Thrash, 2002; Kaplan & Maehr, 2007) all serve to illuminate the disagreements about several fundamental issues within the achievement goal field.

Although several researchers have performed empirical reviews (e.g., Linnenbrink-Garcia, Tyson, & Patall, 2008; Payne, Youngcourt, & Beaubien, 2007; Rawsthorne & Elliot, 1999; Utman, 1997), only Rawsthorne and Elliot explored whether conceptual and methodological differences within achievement goal research influenced the pattern of results. For example, it is possible that researchers who disagree about the potential benefits of performance-approach goals in educational contexts might be measuring goals differently and obtaining divergent results because of these measurement differences. Are achievement goal researchers really talking about the same constructs but using different labels, or are they using the same labels to talk about different things (cf. Marsh, 1994)? In our meta-analysis, we systematically review the first 25 years of achievement goal research and examine the extent to which differences in achievement goal measurement may produce differences in outcomes.

Defining Achievement Goals

In general, researchers define goals as representations of desired results or end states (Austin & Vancouver, 1996; Harackiewicz & Sansone, 1991; Kruglanski, 1996; Pervin, 1983; Tolman, 1926). On the basis of their linguistic–historical analysis of the goal construct in psychology, Elliot and Fryer (2008) distilled five basic features of goals. Goals are (a) focused on an object, (b) used to direct or guide behavior, (c) focused on the future, (d) internally represented (cognitively or otherwise), and (e) something the organism is committed to approach or avoid. Achievement goals generally have been considered to be cognitive representations, rather than implicit needs or drives, with an end state that is centered on *competence*—either developing it (mastery) or demonstrating it (performance; cf. Dweck & Leggett, 1988; Nicholls, 1984). In more recent conceptualizations, these definitions of competence have been crossed with approaching positive outcomes or avoiding negative ones, which leads to four kinds of goals: mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance (Elliot & McGregor, 2001; Pintrich, 2000a). The working definition of *achievement goal* adopted in this article is *a future-focused cognitive representation* that *guides behavior to a competence-related end state* that the individual is committed to either *approach or avoid*.

This definition of achievement goal most closely matches the purpose and goal complex conceptualization of achievement goals (Elliot & Thrash, 2002). In the goals-as-purposes conceptualization, achievement goals are considered to be the purposes or desired outcomes for which individuals exert effort in achievement situations (Dweck & Elliot, 1983; Harackiewicz & Sansone, 1991; Pintrich, 2000a; Urdan & Maehr, 1995). Elliot and Thrash's (2002) goal complex conceptualization differentiated the objective of goal pursuit (e.g., to increase knowledge) from the reasons that those standards were chosen (e.g., to earn a better grade than other students). Although this definition of achievement goal is consistent with how the goal construct has been defined in the psychological literature in general, researchers have not universally agreed upon it (cf. Kaplan & Maehr, 2007). Most notably, proponents of a goal orientation[1] framework maintain that achievement goals are best conceptualized as general schemas (e.g., Ames & Archer, 1987, 1988; Nicholls, 1984), which includes our definition of achievement goals plus associated achievement-related processes (e.g., attributions for success or failure, emotional reactions, levels of persistence). In the goal orientation framework, goals and associated processes are presumed to be interrelated in a broad schema that determines how the individual approaches and responds to achievement situations. This perspective is similar to the original achievement motivation theorists' conceptualization of achievement motive or need, which encompassed positive and negative affect (e.g., anticipatory goal reactions; McClelland, Atkinson, Clark, & Lowell, 1953), attitudes (e.g., valuing of success; Atkinson, 1974), and behaviors (e.g., level of aspiration; Lewin, Dembo, Festinger, & Sears, 1944; Murray, 1938).

It is important to note that we focus on the *goal* aspect of achievement goals, as differentiated from affect, attributions, self-beliefs, and interests, and therefore adopt a more constrained definition of achievement goal. Kaplan and Maehr (2007) argued that limiting the achievement goal conceptualization to end states or standards could remove phenomenological realism from the goal construct. That is, a limitation of our constrained definition may be that it does not mirror the experience of goal pursuit in the real world. Instead, the real-life experience of achievement goal pursuit may be an inseparable blend of theoretically unique components. However, the merits of including end states, attributions, and affect in the goal construct are outweighed, in our opinion, by significant interpretational and theoretical challenges. First, many of the nongoal items that are used to measure mastery goals are nearly identical to items used to measure interest and intrinsic motivation. For example, the item "I read things because I am interested in the subject" is part of Lepper, Corpus, and Iyengar's (2005) Intrinsic Motivation Scale. A similar item, "I do my work because I'm interested in it," was a part of the Mastery Goal Scale of the Patterns of Adaptive Learning Survey (PALS; Midgley et al., 2000) from 1993 until 2000 (Anderman, Urdan, & Roeser, 2003).[2] Second, goal measures are difficult to interpret when they do not reference striving toward desired, or avoiding undesired, future end states. For instance, in Nicholls's task–ego orientation scales (e.g., Duda & Nicholls, 1992), the stem used is "I feel most successful when . . ." followed by "I learn something new" (task) or "I do better than others" (ego). Rather than assessing achievement goals directly, these items measure the achievement-related affect that results from *achieving* a particular end state (as opposed

[1] As used in the literature, "achievement goal orientation" has also been referred to as a trait level of achievement goal adoption, as opposed to a state or situation-specific level of achievement goal adoption (e.g., Finney, Pieper, & Barron, 2004). We prefer to use the term *achievement goal orientation* to refer to the broad schema of achievement-related variables and to the former as traitlike measures. This overlap in terminology is another example of the need for clarity in terminology and theory in motivation research (Murphy & Alexander, 2000; Pintrich, 2000a, 2003).

[2] The PALS has since removed the orientation items from all of their achievement goal scales and is now aligned with our definition of achievement goal.

to *striving* for one). This makes it difficult to understand whether the effects of achievement goals are due to associated processes such as affect, the goal itself, both goals and processes, or spurious associations (if goals and outcomes are measured with similar items). Thus, we believe that a more constrained definition of *goal* may afford greater conceptual clarity when goal effects are examined.

Components and Measures of Achievement Goals

The original definitions of achievement *motivation* included both mastery and performance aspects as a single, omnibus achievement motivation factor. For example, Murray (1938) defined the need for achievement as the desire:

> [t]o accomplish something difficult. To master, manipulate or organize physical objects, human beings, or ideas. To do this as rapidly, and as independently as possible. To overcome obstacles and attain a high standard. To excel one's self. To rival and surpass others. To increase self-regard by the successful exercise of talent. (p. 164)

Early achievement motivation theorists also focused on the attainment of positive outcomes (success) or the avoidance of negative outcomes (failure) in general (e.g., "individual differences in the liking of success in general," Atkinson, 1974, p. 14; a general striving toward goals, Lewin et al., 1944). Subsequently, achievement *goal* theorists (e.g., Ames, 1984; Dweck, 1986; Nicholls, 1984) differentiated the general achievement motive, which focused on attaining general standards of excellence across situations, into goal strivings that focused on competence defined by improvement and skill development (mastery) or performance compared with that of others (performance). Thus, achievement goals are more differentiated concepts than achievement motivation (Spence & Helmreich, 1983). However, there remain fundamental differences and disagreements regarding the nature of each kind of goal and which components should or should not be included as part of each achievement goal construct (e.g., Brophy, 2005; Elliot, 2005; Grant & Dweck, 2003). Because performance goals have received the most scrutiny in the literature, we begin with our review of the performance goal construct.

Performance-Approach Goals

In various reviews of the literature, two basic components have been identified in the definitions of performance goals: an appearance component and a normative component (e.g., Elliot, 1999, 2005; Urdan, 1997; Urdan & Mestas, 2006). Urdan and Mestas (2006) contrasted an appearance component (trying to look good to others) with a competition component (trying to do better than others). Elliot (1999) provided a similar distinction between a self-presentation/approval component and a social comparison (outperforming others) component (see also Anderman et al., 2003). Grant and Dweck (2003) identified four slightly different components of performance goals that focused on validation of ability (appearance), normative comparisons (competition–social comparison), normative ability (combined ability validation and normative comparisons), and outcome goals (focused on attaining a positive outcome, such as a good grade; see also Eison, Pollio, & Milton, 1982).

Although goals with an outcome focus (see also *extrinsic goals*, Pintrich, Smith, Garcia, & McKeachie, 1993) are often considered to be measures of performance goals (Brophy, 2005; Grant & Dweck, 2003), outcome goals (e.g., getting an "A") are neutral in terms of how competence is defined and could be related to either mastery (e.g., wanting to get an "A" because it indicates task mastery) or performance strivings (e.g., wanting to get an "A" because it indicates performing better than others). Recent correlational research reveals that measures of outcome goals are equally correlated with mastery and performance goals (Grant & Dweck, 2003; Sideridis & Mouratidis, 2008). For these reasons, rather than classifying outcome goals and performance goals within the same category (cf. Brophy, 2005), we consider them to be distinct.

On the basis of this review, we identified two components that best reflect the operationalization of performance-approach goals in the literature: appearance and normative, with a third component—evaluative—being a combination of the first two. Within each of these general components, a variety of different definitions and labels have been used in the literature. As summarized in Table 1, the appearance component of performance-approach (PAp) goals focuses on the demonstration and affirmation of ability or self-worth to an audience (e.g., wanting others to think one is smart; *ability*, Butler, 1992; *ability validation*, Grant & Dweck, 2003; *ego/social orientation*, Nicholls, Patashnick, & Nolen, 1985; *appearance*, Urdan & Mestas, 2006). The focus of these items is showing or demonstrating one's own competence to an audience without regard to the performance of others. The normative component, in contrast, is simply an explicit normative comparison or competition (e.g., wanting to do better than others; *performance-approach*, Elliot, 1999; Elliot & Harackiewicz, 1996; Harackiewicz, Barron, & Elliot, 1998; Pintrich, 2000a; *normative*, Grant & Dweck, 2003; Sideridis et al., 2009; *competition*, Urdan & Mestas, 2006). Normative items do not require that the individual show an audience that he or she is better than others; rather, these items implicitly suggest an objective standard whereby the individual can judge whether he or she has performed better than others (e.g., won the game, received the highest exam grade). The evaluative component is a hybrid of the appearance and normative components; its central focus is on the demonstration of ability (appearance), but beyond this, the evaluative component specifies that an adequate demonstration of ability is performance compared with the performance of others (normative). In other words, in evaluative items, the individual desires to have his or her ability evaluated as being greater than others (e.g., wanting the teacher to think one is smarter than other students; *normative ability validation*, Grant & Dweck, 2003; *ego orientation*, Nicholls, 1984; *appearance*, Urdan & Mestas, 2006). These items implicitly require that an expert, authority figure, or informed observer (e.g., teacher, coach, other students) will be able to evaluate the individual's ability relative to others.

Performance-Avoidance Goals

In the mid 1990s, several researchers proposed that performance goals might best be conceptualized in terms of distinct approach and avoidance components (Elliot, 1994; Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997; VandeWalle, 1997). Although the different conceptualizations of performance-

Table 1
Performance-Approach Goal Conceptualizations

Goal component/authors' label	Definition[a]	Example item	Citation
Appearance			
Appearance-approach	"Appearing able or competent to others"	"Sometimes I want to compare my grades because some people would be shocked, like, 'Wow you got this grade?' and 'I never knew you would get this kind of grade.' "[b]	Urdan & Mestas, 2006
Ego orientation	"Demonstrating competence"	I like school work that lets me show how smart I am.	Midgley et al., 1996
Ego/social orientation	"Demonstrating ability"	I feel successful if I show people I'm smart.	Nicholls et al., 1985
Proving goal orientation	"The desire to prove one's competence and to gain favorable judgments about it"	It's important that others know that I am a good student.	VandeWalle, 1997
Ability	"Wanting others to think you're smart"	NA	Butler, 1992
Ability validation	"Seeking to validate one's ability"	It is important to me to validate that I am smart.	Grant & Dweck, 2003
Normative			
Competition-approach	"Wanting to do better than others"	It's important to me that I do better or, like, I'm in the top of the class.**	Urdan & Mestas, 2006
Normative outcome	"Wanting to perform better than others"	I try to do better in my courses than other students.	Grant & Dweck, 2003
Performance-approach	"The goal of performing better than others"	My goal in this class is to do better than others.	Elliot & McGregor, 2001
Ego orientation	NA	I feel really successful when I have the highest test scores.	Duda & Nicholls, 1992
Self-enhancement	"Demonstrate superior abilities"	At school I try to score higher than other students.	Skaalvik, 1997
Evaluative			
Ego orientation	"Demonstrating competence relative to others"	I like to show my teacher that I'm smarter than other kids.	Midgley et al., 1996
Performance-approach	"Focused on the demonstration of competence relevant to others"	I am striving to demonstrate my ability relative to others in this class.	Elliot & Church, 1997
Performance-prove orientation	"To demonstrate and validate the adequacy of one's competence by seeking favorable judgments"	I like to show that I can perform better than my coworkers.	Brett & VandeWall, 1999

Note. The term *goal component* refers to the conceptual grouping of achievement goal constructs that we derived from the literature. The term *authors' label* indicates the actual label or name that the authors use for performance goals in the citation listed. Urdan and Mestas's (2006) achievement goal labels are based on open-ended interviews with students. Therefore, we presented an example statement in place of an example item. NA = achievement goals were not measured.
[a] The quotation marks indicate that the definition is a direct quote from the citation listed in that row. [b] These phrases are from open-ended interviews reported by Urdan and Mestas (2006).

avoidance (PAv) goals can claim commonality in the avoidance of negative outcomes such as performing poorly or doing poorly compared with others, the operationalizations of PAv goals introduce considerable variety in what is to be avoided. As presented in Table 2, the components for performance-avoidance goals found in the literature mirror those for performance-approach (PAp) goals (appearance, normative, evaluative) with the addition of a component tapping worry, concern, or fear about possible negative outcomes (e.g., "My fear of performing poorly is what motivates me in this class"; *performance-avoidance*, Elliot & Church, 1997).

Mastery-Approach Goals

In narrative reviews of the literature, the claim is often made that there is more consensus regarding the conceptualization of mastery goals than performance goals (e.g., Elliot & Thrash, 2001; Grant & Dweck, 2003). For example, Anderman et al. (2003) stated that "survey measures [of performance goals] have varied widely across the literature . . . . Survey measures of mastery goals have generally been consistent across research programs" (pp. 4–5). Although there seems to be a basic, underlying dimension that focuses on learning and skill development, our review suggests that there is actually considerable variability in the components of mastery goals, ranging from interest to curiosity to improvement to fulfillment of one's potential (cf. Sideridis & Mouratidis, 2008). As presented in Table 3, our review indicates that mastery-approach goals have been conceptualized as motivation based on interest and curiosity (e.g., *intrinsic motivation-curiosity*, Lepper et al., 2005; *mastery orientation*, Midgley et al., 1998; *task orientation*, Nicholls, 1984); mastering the requirements of the task (e.g., *mastery-approach*, Barron & Harackiewicz, 2001; *absolute mastery*, Elliot, 1999); improving one's competence and doing

Table 2
Performance-Avoidance Goal Conceptualizations

Goal component/authors' label	Definition[a]	Example item	Citation
Appearance			
Appearance-avoidance	Avoiding looking incompetent	I don't want to be the stupidest kid in this class and everyone looks down on me.[b]	Urdan & Mestas, 2006
Performance-avoidance	Avoid doing worse than others	I'm afraid that if I ask my TA or instructor a "dumb" question, they might not think I'm very smart.	Elliot & Church, 1997
Ego/social orientation	"Demonstrating ability"	I feel successful if I don't do anything stupid.	Nicholls et al., 1985
Self-defeating orientation	"To avoid looking stupid or, more generally, to avoid being negatively judged by others"	At school it is important for me to avoid looking stupid.	Skaalvik, 1997
Avoiding orientation	"Avoiding negation of one's competence and negative judgments from others"	I would rather write a report on a familiar topic so that I can avoid doing poorly.	VandeWalle, 1997
Normative			
Competition-avoidance	"Wanting to avoid doing worse than others"	I don't want to do worse, it's like my pride, basically.**	Urdan & Mestas, 2006
Performance-avoidance	Avoid doing worse than others	My goal this term is to avoid performing worse than other students.	Elliot & McGregor, 2001
Evaluative			
Performance-avoidance	"Avoiding the demonstration of lack of ability (compared to others)"	The reason I do my math work is so the teacher doesn't think I know less than others.	Midgley et al., 1998
		It's important to me that my coach doesn't think that I'm slower than other people on this team.	Bonney, 2006
Negative affect			
Performance-avoidance	Avoid doing worse than others	My fear of performing poorly is what motivates me in this class.	Elliot & Church, 1997; Elliot & McGregor, 2001

Note. The term *goal component* refers to the conceptual grouping of achievement goal constructs that we derived from the literature. The term *authors' label* indicates the actual label or name that the authors use for performance goals in the citation listed.
[a] The quotation marks indicate that the definition is a direct quote from the citation listed in that row. [b] These phrases are from open-ended interviews reported by Urdan and Mestas (2006).

better than one has done in the past; (e.g., *learning*, Dweck, 1986; *intrapersonal mastery*, Elliot, 1999; *mastery orientation*, Midgley et al., 1998); fulfilling one's potential and learning as much as possible (e.g., *mastery-approach*, Bonney, 2006; Elliot & McGregor, 2001); and a preference for challenging activities (e.g., *mastery-challenge*, Grant & Dweck, 2003; *intrinsic motivation-challenge*, Lepper et al., 2005; *intrinsic goal orientation*, Pintrich et al., 1993).

Mastery-Avoidance Goals

Mastery-avoidance (MAv) goals are a relatively new construct (Elliot, 1999; Pintrich, 2000a) for which there is less research than for the other three kinds of achievement goals. Elliot and colleagues are the only researchers who have published scales that include mastery-avoidance goals (Cury, Elliot, Da Fonseca, & Moller, 2006; Elliot & McGregor, 2001), although others have addressed MAv goal measurement in unpublished conference symposia (Easter, Ciani, & Summers, 2008; Hulleman, Rhee Bonney, et al., 2006) and dissertation research (Bonney, 2006).[3] Conceptually, the focus of the construct is to avoid being unable to master a task or activity, failing to learn or develop skills, losing skills that one had previously acquired, or being unable to live up to one's recognized potential. As summarized in Table 4, the components for mastery-avoidance goals mirror some, but not all, of those for mastery-approach goals (task, improvement, potential attainment) with the addition of a component tapping worry, concern, or fear about possible negative outcomes (e.g., "I worry that I may not learn all that I possibly could in this class"; *mastery-avoidance*, Elliot & McGregor, 2001).

[3] Van Yperen (2003) has published a measurement instrument to assess the complete 2 × 2 model of achievement goals, including mastery-avoidance goals, that is different from the types of scales evaluated in this meta-analysis. His instrument presents a series of forced-choice items that require the participant to choose between a pair of achievement goals statements (e.g., "In my study, I find it more important to perform better than 'the average' student" [performance-approach], OR "In my study, I find it more important not to perform worse than the average student" [performance-avoidance]).

Table 3
Mastery-Approach Goal Conceptualizations

Goal component/authors' label	Definition[a]	Example item	Citation
Interest			
Intrinsic motivation–curiosity	Motivation based on interest and curiosity	I read things because I am interested in the subject.	Lepper et al., 2005
Mastery orientation	The goal of developing competence	I do my work because I'm interested in it.	Midgley et al., 1998; Bong, 2001
Task orientation	The goal of gaining insight and knowledge or improving one's skill	I feel successful when I learn something interesting.	Duda & Nicholls, 1992
Curiosity			
Intrinsic motivation–curiosity	Motivation based on interest and curiosity	I work really hard because I really like to learn new things.	Lepper et al., 2005
Mastery orientation	To develop competence	An important reason why I do my class work is because I like to learn new things.	Midgley et al., 1998
Mastery-approach	To develop competence	I prefer school material that arouses my curiosity, even if it is difficult to learn.	Elliot & Church, 1997
Task			
Mastery-approach	To master the task itself	Understanding how to use the new technique is important to me.	Barron & Harackieweicz, 2001
Improvement			
Intrapersonal	To develop competence	I hope to have gained a broader and deeper knowledge of psychology when I am done with this class.	Elliot, 1999
Learning	Active striving toward development and growth of competence, or increase one's ability	I strive to constantly learn and improve in my courses.	Grant & Dweck, 2003
Potential attainment			
Mastery-approach	To strive for one's maximum potential attainment	I want to learn as much as possible from this class.	Elliot & McGregor, 2001
Challenge			
Task orientation	Focus is on learning and understanding	In math classes, I like to solve problems by working hard.	Skaalvik, 1997
Mastery-challenge	The desire to master challenges	It is very important to me to feel that my coursework offers me real challenges.	Grant & Dweck, 2003
Intrinsic goal orientation	Participating in a task for challenge, curiosity, mastery	In a class like this, I prefer course material that really challenges me so I can learn new things.	Pintrich et al., 1993
Learning goal orientation	"To develop the self by acquiring new skills, mastering new situations, and improving one's competence"	I am willing to select a challenging work assignment that I can learn a lot from.	VandeWalle, 1997
Intrinsic motivation–challenge	The preference for challenging schoolwork	I like hard work because it's a challenge.	Lepper et al., 2005

Note. The term *goal component* refers to the conceptual grouping of achievement goal constructs that we derived from the literature. The term *authors' label* indicates the actual label or name that the authors use for mastery goals in the citation listed.
[a] The quotation marks indicate that the definition is a direct quote from the citation listed in that row.

In summary, our conceptual review reveals diversity in achievement goal definitions. We identified three components of performance-approach goals (appearance, normative, evaluative), four components of performance-avoidance goals (appearance, normative, evaluative, and fear of negative outcomes), five components of mastery-approach goals (interest, task-mastery, improvement, potential attainment, and challenge seeking), and four components of mastery-avoidance goals (task mastery, improvement, potential attainment, and fear of negative outcomes). The avoidance versions of performance and mastery goals mirror the approach versions, with the exception that avoidance goals tend to also include fear of negative outcomes.

Disagreements and Discrepant Findings

Our review of the literature reveals diversity in the conceptualization and measurement of achievement goals. On the basis of this review, we now consider whether inconsistencies in the conceptualization of mastery and performance goals are related to their varied patterns of associations with motivational processes and outcomes. Early research on performance goals revealed null or negative relationships with achievement-related processes and outcomes (Ames, 1992; Dweck & Leggett, 1988; Rawsthorne & Elliot, 1999; Utman, 1997). However, the early measures and manipulations of performance goals often included both approach and avoidance language.

Table 4
Mastery-Avoidance Goal Conceptualizations

Goal component/authors' label	Definition[a]	Example item	Citation
Task			
Mastery-avoidance	"Focused on avoiding task-based incompetence"	I am striving to avoid an incomplete understanding of the material.	Elliot & Murayama, 2008
Improvement			
Mastery-avoidance	"Focused on avoiding intrapersonal incompetence"	At work, I focus on not doing worse than I have personally done in the past on my job.	Baranik et al., 2007
Potential attainment			
Mastery-avoidance	Standard for performance is comparison with one's own standards (i.e., potential) or to avoid being unable to reach one's maximum potential attainment on a task	My goal this semester is to avoid learning less than I possibly could.	Cury, Elliot, et al., 2006
		It's important to me that I don't do worse than I know I'm capable of doing.	Bonney, 2006
Negative affect			
Mastery-avoidance	Avoiding task/intrapersonal incompetence	I worry that I may not learn all that I possibly could in this class.	Elliot & McGregor, 2001

Note. The term *goal component* refers to the conceptual grouping of achievement goal constructs that we derived from the literature. The term *authors' label* indicates the actual label or name that the authors use for mastery goals in the citation listed.
[a] The quotation marks indicate that the definition is a direct quote from the citation listed in that row.

Once researchers separated performance goals into approach and avoidance components, it was revealed that the negative associations with performance goals were often due to the avoidance component (e.g., Day, Yeo, & Radosevich, 2003; Elliot, 1994; Payne et al., 2007; Rawsthorne & Elliot, 1999). In contrast, performance-approach goals often demonstrated positive associations with performance (Harackiewicz, Barron, Pintrich, et al., 2002; Stoeber, Uphill, & Hotham, 2009; Wolters, Yu, & Pintrich, 1996). The approach–avoid distinction did not completely explicate the pattern of relationships for performance-approach goals, however, as they have sometimes been found to be associated with maladaptive processes such as reduced help-seeking behavior, increased anxiety, cheating, self-handicapping, and maladaptive responses to conflict (e.g., Anderman, Griesinger, & Westerfield, 1998; Darnon, Butera, & Harackiewicz, 2007; Elliot & McGregor, 1999; Karabenick, 2003; Midgley, Arunkumar, & Urdan, 1996; Murdock, Miller, & Kohlhardt, 2004; Ryan & Pintrich, 1997). It is important to note that many of the studies linking performance-approach goals to maladaptive processes did not distinguish between the normative and appearance components.

The research on mastery goals has been much more consistent: mastery-approach goals have been found to be positively associated with a range of adaptive motivational processes, such as deep study strategies, persistence, effort, and self-efficacy, as well as intrinsic motivation and interest (Grant & Dweck, 2003; Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Liem, Lau, & Nie, 2008; Vrugt & Oort, 2008). There has been much less research on mastery-avoidance goals, and the empirical results indicate a more negative pattern of associations with motivational processes and outcomes compared with mastery-approach goals (Moller & Elliot, 2006).

Mastery Goals Versus Multiple Goals Perspectives

Although these patterns of findings have been fairly consistent, there remains sufficient controversy surrounding the empirical results that a systematic review is warranted. For example, the finding that performance-approach goals, but not mastery-approach goals, are more consistently related to performance has produced much debate (cf. Harackiewicz, Barron, Pintrich, et al., 2002; Kaplan & Middleton, 2002; Midgley et al., 2001). Some theorists have argued that performance-approach goals can have beneficial effects for some students and, furthermore, that this pattern of findings supports a multiple goals approach in which both mastery and performance goals may each lead to unique, adaptive outcomes (i.e., the *multiple goal perspective*; Harackiewicz, Barron, Pintrich, et al., 2002). In contrast, other researchers have argued that the costs of performance-approach goals outweigh the benefits and that researchers and policy makers should exclusively advocate mastery goal pursuit in learning situations (i.e., the *mastery goal perspective;* Brophy, 2005; Midgley et al., 2001; see also Ames, 1992; Nicholls, 1979). The authors of most of the discussions have used narrative reviews rather than meta-analyses to support their positions, and thus one goal of our goals in the current meta-analysis was to provide a more systematic and inclusive review.

Differences in opinions about performance-approach goals may be due to systematic differences in methodology, in particular the achievement goal measures or samples used. In terms of measurement, researchers endorsing the multiple goals perspective tend to utilize Elliot and colleagues' Achievement Goals Questionnaire (AGQ; Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot & Murayama, 2008), which focuses on the normative comparison component of the performance goal construct (e.g., "My goal in

this class is to do better than others," Elliot & McGregor, 2001). In contrast, researchers from the mastery goal perspective tend to measure achievement goals using the PALS. In their review of the history of the PALS, Anderman et al. (2003) noted that PALS items have become exclusively focused on the self-presentation component of the performance goal construct (e.g., "One of my goals is to show others that I'm good at my class work," Midgley et al., 2000). Thus, the difference in opinions regarding performance-approach goals may be due, in part, to the instruments used.

There are also differences in the samples used in the mastery and multiple goal research programs. The major proponents of the multiple goals perspective (e.g., Harackiewicz, Barron, Pintrich, et al., 2002) have tended to study undergraduate students (often enrolled in normatively graded classes). In contrast, the proponents of the mastery goals perspective have used a much wider range of samples, including elementary, middle, and high school students as well as undergraduates (e.g., Midgley et al., 2001). It is therefore plausible that conclusions about the benefits of performance-approach goals are limited to the college context. Though this possibility has been raised before (Midgley et al., 2001), it has not yet been systematically tested.

Structure of Achievement Goal Relationships

Conceptual disagreements and measurement imprecision may also contribute to the lack of consensus over the most appropriate theoretical framework for achievement goal theory (e.g., Elliot, 2005; Kaplan & Maehr, 2007), and whether the mastery-avoidance goals are a necessary addition (Cury et al., 2006; Easter et al., 2008; Hulleman, Rhee Bonney, et al., 2006). One way to determine which model most accurately reflects the available data is to examine the predictive and discriminant validity of model components (Barron, Brown, Egan, Gesauldi, & Marchuk, 2008). For example, if performance-approach and performance-avoidance strivings are distinct constructs, then we would expect them to be relatively uncorrelated with each other (discriminant validity) as well as to have different patterns of associations with outcomes (predictive validity). In our meta-analysis, we consider both of types of validity in examining the structure of achievement goals.

The Current Research

In this meta-analysis, we evaluate the current state of construct validity in achievement goal research. To this end, we focused our review on research that utilized measures of achievement goals (i.e., a future-focused, cognitively represented, competence-related end states that the individual approaches or avoids) as opposed to measures of achievement goal orientations or manipulations of achievement goals. Individual achievement goal items were used as the concrete representations of the theorized achievement goal constructs. In this approach, achievement goals were operationally defined by the constituent items in survey instruments. Although the instruments are imperfect representations of the theoretical constructs, the individual items provide the most proximal representations of the construct (Barron et al., 2008; Campbell, 1969; Shadish, Cook, & Campbell, 2002) and enabled us to test the theoretical underpinnings of the differing frameworks. Specifically, we first quantified differences in the operationalization (i.e., measurement) of achievement goals. Next, we examined whether these differences affected the basic structure of achievement goals (e.g. correlations between different kinds of achievement goals) and their relationships with interest and performance outcomes. Thus, by examining methodological differences in goal measurement, we hope to clarify and refine the theoretical architecture of achievement goal research (cf., Elliot & Murayama, 2008).

It is important to note that our definition of goal and subsequent coding of goal items forms the foundation of our article, and any conclusions arising from our research synthesis should be viewed through this lens. Although other definitions could be used, we believe our approach has several unique and important advantages. First, it provides consistency with the broader psychological literature on goals (e.g., Austin & Vancouver, 1996) and enables precision of interpretation regarding goal effects (as opposed to effects due to self-beliefs, attributions, or affect) not possible when a broader definition is used (cf. Elliot & Murayama, 2008). Second, it allows us to extend prior meta-analyses of the achievement goal literature that do not account for differences in goal operationalizations (e.g., Payne et al., 2007; Utman, 1997). Third, in our approach, recommended psychometric practices are used. In fields in which construct definitions are not universally agreed upon, it is recommended that initial meta-analyses focus on different conceptualizations of a construct separately, and then, as understanding of the field develops, broader definitions can be used (Hunter & Schmidt, 1990; Viswesvaran & Ones, 1995). Otherwise, important differences between construct definitions can be lost in the overall analysis.

Evaluation of the effects of measurement differences on achievement goal relationships required a sequential approach. After calculating the overall achievement goal correlations, we examined whether differences in the type of scale used (e.g., AGQ, PALS, and so forth) moderated these relationships. We also dug deeper into each scale by coding individual items on the basis of components of each kind of goal (e.g., appearance, evaluative, and normative components of performance goals). Using the coding of individual items, we evaluated whether conceptual differences in scale items moderated the overall achievement goal correlations. We also examined additional moderators of achievement goal effects that are relevant to current debates in the field (e.g., grade in school, gender, ethnicity, nationality, achievement domain) and those that are typically included in meta-analytic reviews (e.g., publication status).

Finally, we took two approaches to investigating the structure of achievement goals. First, by examining the correlations between the four achievement goal constructs, we could evaluate their statistical independence as measured with each type of scale. Second, by examining the correlations between each kind of achievement goal and outcomes, we could evaluate whether each kind of goal is associated with a different pattern of results (i.e., assess discriminant validity) and thus provide additional information about achievement behavior.

Method

Sample of Studies

We conducted a comprehensive literature review to identify published and unpublished empirical studies through December

2006 in which achievement goals had been measured. First, we searched several electronic databases (e.g., PsycINFO, Educational Research Information Center [ERIC], Education Full Text, Web of Knowledge, Google Scholar, and Dissertation Abstracts International) using the following search terms: *mastery*, *performance*, *mastery-approach*, *mastery approach*, *mastery-avoidance*, *mastery avoidance*, *performance-approach*, *performance approach*, *performance-avoidance*, *performance avoidance*, and *achievement goal*. Second, we searched specific individual journals, including the *Academy of Management Journal*, *American Educational Research Journal*, *British Journal of Educational Psychology*, *Contemporary Educational Psychology*, *Journal of Applied Psychology*, *Journal of Educational Psychology*, *Journal of Educational Research*, *Journal of Experimental Social Psychology*, *Journal of Personality and Social Psychology*, and *Personality and Social Psychology Bulletin* with the same search terms. Third, we searched the web site of the American Educational Research Association (AERA), which provides abstracts of posters and papers presented at AERA conferences, and contacted authors with requests for their data. Fourth, we examined the reference sections of each article for additional citations. Finally, we e-mailed authors with prior publications on measurement of achievement goals, asking for any current or unpublished research, and we conducted database searches using author names (e.g., Dweck, Elliot, Midgley, Pintrich, Skaalvik, and so on).

In the first stage of screening, we retained a study if it was empirical and achievement goals were measured rather than manipulated. If this information was unavailable from the abstract, we obtained the complete article or unpublished data for inclusion in the next stage of screening. To retain a precise focus on studies of achievement goals as previously defined, we excluded studies in which goals were measured with statements of positive affect rather than goal-relevant language (e.g., "I feel successful when . . . "; *task/ego orientation*; Duda & Nicholls, 1992) from our sample. Although some studies included in our sample did include individual affective statements, if these task and ego orientation scales were used exclusively, then the study was excluded.

In the second stage of screening, studies were retained if the following additional criteria were met: (a) sample sizes were reported, and (b) at least one zero-order correlation for the variables of interest was reported (i.e., goal–goal, goal–performance, goal–interest) or one goal reliability statistic was reported. If a study did not include any of this information, we attempted to contact the first author to obtain it. Thus, studies in which only descriptive statistics of achievement goals were provided or in which path coefficients (from multiple regression or structural equation modeling) were reported without accompanying zero-order correlations were not included in our sample unless we received additional information from the author(s). Although multiple regression is immensely valuable as an analytic approach to understanding the unique effects of multiple achievement goals on outcomes, from a meta-analytic perspective, it is not appropriate to combine these unique estimates across studies. Within a particular analysis, the regression coefficient associated with an achievement goal represents the effect of that goal after adjustments for the effects of all other predictors in the model (e.g., grade in school, gender, other goals). Because these regression models varied from study to study (e.g., some models included the full 2×2 model of goals, whereas other did not; in some studies, gender and prior ability were controlled), the meaning of a particular achievement goal's regression coefficient is not directly comparable between studies.[4] In contrast, zero-order correlations between two variables are always comparable to one another, as they always represent a measure of the total statistical overlap between those variables regardless of how they may relate to any additional variables. In addition, meta-analytic methods for continuous data (including the hierarchical linear modeling approach we used) are based on incorporating study-level zero-order correlations as the unit of analysis. Thus, although analysis of zero-order correlations does not allow for estimation of the unique relationship between goals and outcomes, it does allow for comparison across studies and is the most appropriate statistical approach to use within the meta-analytic framework (Hunter & Schmidt, 1990).

Final Sample of Studies

The search and coding procedure produced a final sample of 243 studies. These studies comprised 91,087 participants and yielded 1,567 effect sizes.

Coding Studies

The following information was coded for each study by at least two of the first three authors, and disagreements were resolved through discussion and consensus with a third author:

1. Goal-goal, goal-performance and goal-interest zero-order correlations,
2. Sample size for each correlation,
3. Reliability for each scale (achievement goals, performance, interest),
4. Mean age of participants,
5. Percentage of female participants,
6. Grade level of participants in studies conducted in educational settings,
7. Percentage of the sample that was non-Caucasian,
8. Nationality of the sample (e.g., North American, European, Asian),
9. Publication status (e.g., journal, conference, unpublished),
10. Achievement domain (e.g., school, sports, work),
11. The type of performance (e.g., course grades, exam scores) and interest measures (e.g., interest in psychol-

[4] One consequence of immediate concern to meta-analysis is that of suppression. To the extent that achievement goals may be correlated with each other—and potentially more strongly than they may be correlated with an outcome—it is possible for a regression coefficient to have the opposite sign of its predictor's "true" relationship to the outcome. See Cohen and Cohen (1983) for an excellent discussion of suppression in multiple regression.

ogy, intrinsic motivation to learn) used in the study (if any), and

12. Whether the study used a previously developed achievement goal instrument (e.g., PALS; Midgley et al., 2000; or AGQ; Elliot & Church, 1997) or one customized to the study.

Individual item coding. In addition to general study characteristics, the individual items comprising each achievement goal scale were coded into several categories. Before rating any individual scale items, we developed categories based on the components of achievement goals as outlined in the literature. Our main objective was to connect the main theoretical components with the operational definitions of achievement goals found in the literature. We used earlier classification attempts as our starting point when developing our categories (e.g., Grant & Dweck, 2003; Sideridis & Mouratidis, 2008; Urdan & Mestas, 2006). Consistent with our review of the literature, our categories reflected three components of performance goals (appearance, normative, and evaluative) and three components of mastery goals (potential, improvement, and task).

Following the a priori determination of the item categories, we began the item coding process. First, we determined whether the item used language that matched our definition of a goal: a future-focused, cognitive representation that guides behavior to a competence-related (mastery or performance) end state that the individual is committed to either approach or avoid. Thus, the item needed to assess or allow inference of goal-directed reasons or standards for achievement-relevant behavior (e.g., "My goal is to . . . ," "I want to . . . ," "It is important to me to . . . ," "The main reason I study is . . . "), as opposed to goal-related affect and interest (e.g., "I feel successful when . . . ," "I am concerned with . . . ," "I am interested in . . . "). Items that did not reflect language that explicitly corresponded to our three-part definition of a goal were coded as *no goal*.

Next, we coded items as "general goal" if they were double-barreled, or if they invoked goal-relevant language but did not capture any of the previously described components of achievement goals (e.g., "Getting good grades in my math class is more important than learning the material"). Finally, we coded goal-relevant items on the basis of the goal component that the item most strongly represented. All scale items were individually coded by Chris S. Hulleman, Sheree M. Schrager, and Shawn M. Bodmann, who agreed on 81% of the items ($\kappa = .79$). All disagreements were resolved through consensus prior to conducting the quantitative analyses. The following paragraphs describe the coding system, including exemplars for each category (see also Tables 5 and 6).

Performance-approach (PAp) item codes. As presented in Table 5, items that had only competitive or normative comparisons were coded as *performance-normative* (e.g., "My goal this semester is to get a better grade than other students"), items that had appearance concerns were coded as *performance-appearance* (e.g., "It is important to me that my peers think I am good at sports"), and items in which appearance concerns focused on demonstrating ability relative to a normative standard were coded as *performance-evaluative* (e.g., "I want to show my teacher that I'm smarter than other students"). Items were coded into a *performance-general* goal category if they represented goal language but were not exclusively performance-approach goals. For example, in the item "Getting good grades in my math class is more important to me than learning the material," it is not clear whether the participant is responding to the importance of getting good grades, learning the material (mastery), or both. The performance-general goal category also included items that focused on a performance outcome without referring to appearance or normative concerns, such as "My goal is to get a good grade in this class," because the purpose of the desired end state—in this case, getting a good grade—is not clearly performance-approach in nature. Items from measures labeled as performance goals that did not contain goal-relevant language were coded as *performance–no goal* (e.g., "In study or learning, you are successful only if you learn more than others").

Mastery-approach (MAp) item codes. As presented in Table 6, items that focused on learning as much as possible and maximizing potential were coded as *mastery-potential* (e.g., "I want to learn as much as possible in this course"). Items that focused on improving skills or exceeding prior performance were coded as *mastery-improve* (e.g., "I strive to constantly learn and improve in my courses"). Items with goal language that focused on mastering the task itself were coded as *mastery-task* (e.g., "Understanding how to use the new technique is important to me"). Items were coded as *mastery-general* if they represented goal language but were not mastery-approach specific. For example, in the item, "The opportunity to do challenging work is important to me," it is not possible to determine whether the item is endorsed because the respondent wishes to master the task, fulfill his or her potential, or do better than others. Additionally, items that had goal language focused on interest as the motivation for goal strivings were coded as *mastery-interest* (e.g., "I read things because I am interested in the subject") and items that were focused on learning, rather than a specific task, as the desired end state were coded as *mastery-learning* (e.g., "An important reason why I do my class work is because I like to learn new things"). Finally, items that did not contain goal-relevant language were coded as *mastery–no goal* (e.g., "I like learning new things from physical education, even if I make mistakes").

Performance-avoidance (PAv) and mastery-avoidance (MAv) item codes. The goal scales for performance-avoidance and mastery-avoidance were identical to their approach counterparts, with the addition of coding items that referred to anxiety, fear, or negative affect as *performance-fear* (e.g., "I'm afraid that if I make a mistake in physical education, people will think I'm no good at it") and *mastery-fear* (e.g., "I worry that I may not learn all that I possibly could in math").

Moderator Coding

We tested two groups of moderators in our analyses: (a) moderators that were relevant to the construct (i.e., theoretical definition) of achievement goals and (b) additional moderators that tested other theoretically relevant questions in the literature (e.g., grade in school, gender, nationality) or that are typically used in meta-analytic reviews (e.g., publication status). Tables 7–10 present descriptive statistics for the moderators tested in this meta-analysis.

Table 5
Performance Goal Coding System

Goal component/coding category/Example item	Approach	Avoidance	Citation
Normative			
Performance-normative			
I try to do better in my courses than other students.	X		Grant & Dweck, 2003
My goal in this class is to do better than others.	X		Elliot & McGregor, 2001
At school I try to score higher than other students.	X		Skaalvik, 1997
My goal this term is to avoid performing worse than other students.		X	Elliot & McGregor, 2001
I just want to avoid doing badly on the problem sets compared to others.		X	Senko & Harackiewicz, 2005
Appearance			
Performance-appearance			
I like school work that lets me show how smart I am.	X		Midgley et al., 1996
It's important that others know that I am a good student.	X		VandeWalle, 1997
It is important to me to validate that I am smart.	X		Grant & Dweck, 2003
One of my main goals in PE is to avoid looking like I can't do it.		X	Carr, 2006
One of the main reasons I would not play a solo ensemble is to avoid looking like a bad player.		X	Smith, 2005
Evaluative			
Performance-evaluative			
I like to show my teacher that I'm smarter than other kids.	X		Midgley et al., 1996
It is very important to me to confirm that I am more intelligent than other students.	X		Grant & Dweck, 2003
My goal is to show how good I am at German, compared to the other students in this class.	X		Rhee & Cortina, 2005
The reason I do my math work is so the teacher doesn't think I know less than others.		X	Midgley et al., 1998
It's important to me that my coach doesn't think that I'm slower than other people on this team.		X	Bonney, 2006
Other			
Performance-general			
It is important to me to get good grades.	X		Grant & Dweck, 2003
I read about the news only if I am going to be tested on it.	X		Anderman & Johnston, 1998
The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	X		Pintrich et al., 1993
My goal in this class is to get a good grade.	X		Harackiewicz et al., 1997
Getting good grades in my math class is more important to me than learning the material.	X		Gonzalez & Wolters, 2006
When I swim, I don't care what my time is, as long as I beat people.	X		Bonney, 2006
My goal for this class is to avoid performing poorly.		X	Elliot & Church, 1997
I want to avoid making mistakes at this camp.		X	Hulleman et al., 2008
I try to avoid discovering that others are better than me.		X	Button et al., 1996
Performance–no goal			
I feel successful if I show people I'm smart.	X		Nicholls et al., 1985
I feel successful when I'm the smartest.	X		Duda & Nicholls, 1992
Getting a good grade in this class is the most satisfying thing for me right now.	X		Pintrich et al., 1993
I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.		X	Baranik et al., 2007
The worst thing about making mistakes at school is that other students may notice.		X	Skaalvik, 1997
Performance-fear			
My fear of performing poorly is what motivates me in this class.		X	Elliot & Church, 1997
It makes me anxious when I know my family and friends will compare my failures to those of others.		X	Horvath et al., 2001

Achievement goal construct moderators. We took a two-pronged approach in assessing the impact of different conceptualizations of achievement goals on the correlations in our data set. First, in order to represent the dominant perspectives in the field, we coded the type of achievement goal scale used in the study (*scale type*) into binary dummy variables with Elliot and colleagues' AGQ (Elliot & Church, 1997; Elliot & McGregor, 2001) as the reference group and either Midgley and colleagues' PALS (e.g., Midgley et al., 2000); another published, consistently used achievement goal scale (e.g., Skaalvik, 1997; VandeWalle, 1997); or a scale adapted and customized for the study (e.g., Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997) as the comparison group.

Second, we utilized the codes given to the individual items to assess whether differences in individual item types moderated the correlations in our data set. At a broader level, we coded each achievement goal scale according to the percentage of items within that scale that contained goal language relevant to that particular achievement goal as determined by our item-level coding (*percentage goal type*). For example, for performance-approach goals, any item that (a) contained goal-related language, (b) referred to others or to ability, and (c) was framed in an approach manner was included in the "performance-approach relevant" category. Thus, any item coded as performance-appearance, performance-evaluative, or performance-normative was included in the performance-approach relevant variable, whereas items coded perfor-

Table 6
Mastery Goal Coding System

Goal component/coding category/Example item	Approach	Avoidance	Citation
Potential attainment			
Mastery-potential			
My goal in this class is to learn as much as I can about this topic.	X		Senko & Harackiewicz, 2005
When I played the games, I wanted to improve my ability to play.	X		Bereby-Meyer & Kaplan, 2005
It's important to me that I don't do worse than I know I'm capable of doing.		X	Bonney, 2006
My goal is to avoid falling short of my potential in this class.		X	Rhee & Cortina, 2005
Improvement			
Mastery-improve			
I hope to have gained a broader and deeper knowledge of psychology when I am done with this class.	X		Elliot, 1999
I strive to constantly learn and improve in my courses.	X		Grant & Dweck, 2003
An important reason why I do my work is that I want to get better at it.	X		Midgley et al., 1998
At work, I focus on not doing worse than I have personally done in the past on my job.		X	Baranik et al., 2007
My goal in this class is to avoid doing worse than I have in the past.		X	Rhee & Cortina, 2005
Task			
Mastery-task			
Understanding how to use the new technique is important to me.	X		Barron & Harackieweicz, 2001
At school it is important to me to learn to solve the problems we are working with.	X		Skaalvik, 1997
It is important to me to "not" do my math work incorrectly.		X	Bong, 2009
My main goal at work is to avoid messing up the tasks required for my job.		X	Baranik et al., 2007
Interest			
Mastery-interest			
I read things because I am interested in the subject.	X		Lepper et al., 2005
Curiosity			
Mastery-learning			
An important reason why I do my class work is because I like to learn new things.	X		Midgley et al., 1998
Other			
Mastery-general			
The opportunity to do challenging work is important to me.	X		Horvath et al., 2001
Mastery–no goal			
I prefer school material that arouses my curiosity, even if it is difficult to learn.	X		Elliot & Church, 1997
In math classes I like to solve problems by working hard.	X		Skaalvik, 1997
I feel successful when I learn something interesting.	X		Duda & Nicholls, 1992
It is very important to me to feel that my coursework offers me real challenges.	X		Grant & Dweck, 2003
In a class like this, I prefer course material that really challenges me so I can learn new things.	X		Pintrich et al., 1993
I am willing to select a challenging work assignment that I can learn a lot from.	X		VandeWalle, 1997
Mastery-fear			
I worry that I may not learn all that I possibly could in math.		X	Bong, 2009
Sometimes I'm afraid that I may not understand the content of this class as thoroughly as I'd like.		X	Elliot & McGregor, 2001

mance-general goal or performance–no goal were not. We then summed the number of goal-relevant items, divided by the total number of items in the scale, and multiplied by 100. This produced a continuous variable (percentage goal type) that could range from 0 to 100% and was defined as the proportion of the items in each achievement goal scale that contained goal language related to that particular achievement goal (i.e., %PAp, %MAp, %PAv, %MAv). For example, in the five-item performance-approach goal scale used by Kaplan, Gheen, & Midgley (2002), two of the items were performance-normative ("I want to do better than other students in my math class," and "Doing better than other students in math is important to me"), one item was performance-evaluative ("I'd like to show my teacher that I'm smarter than the other students in my class"), and two items were no goal ("I would feel really good if I were the only one who could answer the teacher's questions in math class," and "I would feel successful in math if I did better than most of the other students in the class"). Thus, the Kaplan et al. (2002) scale would be coded as 60% performance-approach (2 performance-normative + 1 performance-evaluative = 3 of 5 items).

For mastery-approach goals, any item that (a) contained goal-related language, (b) referred to learning, improving, or mastering, and (c) was framed in an approach manner was collapsed into the mastery-approach-relevant category. This included mastery-task, mastery-improve, and mastery-potential. All other item types were excluded because they did not contain mastery goal-relevant language (mastery-general goal, mastery–no goal) or were worded in such a way that the goal was to do something interesting (mastery-interest) or learn without respect to a specific task (mastery-learning). For example, in the original AGQ (Elliot & Church, 1997), two items were mastery-potential ("I want to learn as much as possible from this class," and "It is important for me to understand the content of this course as thoroughly as possible"), one was mastery-improve ("I hope to have gained a broader and deeper

Table 7
Descriptive Statistics for Moderator Variables

Moderator	Sample size	%	Range	Mean	*SD*
Achievement goal scale					
AGQ	67	28			
PALS	63	26			
Custom scale	94	39			
Other published scale	62	26			
% PAp scale	176		0, 1	.71	.34
% PAv scale	132		0, 1	.34	.43
% MAp scale	175		0, 1	.48	.41
% MAv scale	48		0, 1	.08	.24
Sex (proportion female)	208		0, 1	.59	.15
Grade					
Elementary school	20	9			
Middle school	38	17			
High school	22	10			
Undergraduate, Intro to Psych	53	24			
Undergraduate, other	89	40			
Graduate	1	0			
Ethnicity					
Reported $<$ 85% White	95	41			
Reported $\geq$ 85% White	27	12			
Unspecified	110	47			
Nationality					
U.S./Canadian	136	67			
European	37	18			
Asian	19	9			
Other	12	6			
Achievement domain					
School	201	87			
Sports	10	4			
Work	7	3			
Social	5	2			
Other	9	4			
Publication source					
Conference or unpublished	72	31			
Peer-reviewed journal	163	69			

Note. AGQ = Achievement Goals Questionnaire; PALS = Patterns of Adaptive Learning Survey; PAp = performance approach; PAv = performance avoidance; MAp = mastery approach; MAv = mastery avoidance.

knowledge of psychology when I am done with this class"), one was mastery-task ("I desire to completely master the material presented in this class"), and two were mastery–no goal ("In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn," and "In a class like this, I prefer course material that really challenges me so I can learn new things"). Thus, this scale would be coded as 67% mastery-approach (2 mastery-potential + 1 mastery-improve + 1 mastery-task = 4 of 6 items).

The percentage goal type categories for performance-avoidance and mastery-avoidance were identical to their approach counterparts and excluded items that contained anxiety, fear, or negative affect (performance-fear, mastery-fear) or that did not contain the appropriate achievement goal-relevant language (i.e., performance-general goal/no goal; mastery-general goal/interest/learning/no goal).

Although the percentage goal type analysis provides a global assessment of the effects of having achievement goal-related language versus not having that language, our theoretical analysis required that we examine the effects of each component of achievement goals (e.g., performance-appearance, performance-normative, performance-evaluative) on achievement goal correlations. Therefore, in order to conduct a more fine-grained analysis of the extent to which conceptual differences in achievement goal items moderated the correlations in our data set, we analyzed each achievement goal scale on the basis of the type of item that best characterized the scale (*majority scale code*). In other words, if a scale had a majority of items that were of only one category, we coded the entire scale according to the dominant category. For example, if more than 50% of the items in a particular scale were performance-normative, or if exactly 50% were performance-normative and there were at least three item types present in the scale, then the category that best characterized that scale was performance-normative, and the scale would be coded as performance-normative. For each achievement goal scale in each study, we created a dichotomous variable that represented whether a particular scale contained a majority of each single item type. Scales with "ties" (e.g., 50% performance-normative and 50% performance-appearance) and scales that did not have 50% or more items coded as a single item type (e.g., 33% performance-normative, 33% performance-appearance, and 33% no goal) were classified as having no clear majority. Because of sample size requirements in the analyses, some majority scale codes had to be collapsed for analysis when it was conceptually reasonable to do so. Descriptive statistics for the majority scale codes are presented in Table 8.

For performance-approach goals, the performance-normative scales were set as the comparison group because they had the largest sample size. In addition, the performance-evaluative scales were combined with performance-appearance to increase their sample size. This grouping also made sense because the core of both components are appearance and self-presentation concerns (Butler, 1992; Elliot, 1999; Urdan & Mestas, 2006). Although performance-evaluative items contained a normative component, the focus was on an external agent's perceptions or evaluation that

Table 8
Descriptive Statistics for the Majority Scale Codes

	Approach		Avoidance	
Majority scale code	*k*	%	*k*	%
Performance goal				
Normative	83	47	7	5
Appearance	10	6	31	23
Evaluative	4	2	1	1
General	1	1	35	27
No goal	46	26	13	10
Fear	0	0	31	23
No majority	32	18	14	11
Total	176	100	132	100
Mastery goal				
Potential	45	26	1	2
Improve	2	1	1	2
Task	6	3	0	0
General	2	1	0	0
Learn	1	1	0	0
No goal	60	34	0	0
Fear	0	0	44	92
No majority	59	34	2	4
Total	175	100	48	100

Table 9
Frequency of the Number of Different Item Categories Represented Within Each Achievement Goal Scale

	No. of categories									
	1		2		3		4+			
Achievement goal scale	No.	%	No.	%	No.	%	No.	%	*M*	*SD*
Performance-approach	58_a	33	$42_{a,b}$	24	59_a	34	17_a	10	2.19	1.01
Performance-avoidance	4_b	3	86_c	65	34_b	26	8_a	6	2.83	1.05
Mastery-approach	17_b	10	57_a	33	43_b	25	58_b	33	2.36	0.67
Mastery-avoidance	43_c	90	3_b	6	2_c	4	0_a	0	1.15	0.46

Note. The headings "No." and "%" refer to the number and percentage of studies. Different subscripts within columns represent significant differences.

the individual was better than others. Thus, we felt these items more clearly reflected an appearance component than a purely normative component. Thus, three dummy variables were created for performance-approach goals, with performance-normative set as the reference group and contrasted with performance-appearance/evaluative, performance–no goal, and performance–no clear majority. For performance-avoidance goals, four dummy variables were created with performance-normative set as the reference group and contrasted with performance-appearance/evaluative, performance-fear, performance–no goal, and performance–no clear majority.

For mastery-approach goals, sample sizes required consolidation into five groups: mastery-improve and mastery-task (combined), mastery-potential, mastery–general goal and mastery–learning goal (combined), mastery–no goal, and mastery–no clear majority. There were no mastery-approach scales that were composed of a majority of mastery-interest items. Four dummy variables were created, with mastery-potential set as the reference group and contrasted with mastery-improve/mastery-task, mastery–general goal/learning goal, mastery–no goal, and mastery–no clear majority. For mastery-avoidance goals, two dummy variables were created, with mastery-potential set as the

Table 10
Hierarchical Linear Modeling Results for Baseline Achievement Goal–Outcome Correlations, Intergoal Correlations, and Scale Reliabilities

"Outcome" correlation	No. of studies	Coefficient		*t*	Variance component	χ^2
		d metric	*r* metric			
Performance outcomes and						
PAp	98	0.06	.06	5.24**	0.01	374.77**
PAv	63	−0.13	−.13	−8.43**	0.01	238.16**
MAp	95	0.11	.11	8.55**	0.01	416.82**
MAv	12	−0.12	−.12	−5.08**	<0.01	23.26*
Interest and						
PAp	52	0.07	.07	4.11**	0.01	203.52**
PAv	34	−0.07	−.07	−2.87**	0.02	169.92**
MAp	52	0.47	.44	15.98**	0.04	633.30**
MAv	9	−0.06	−.06	−1.83	<0.01	18.05*
Goal–goal correlations						
PAp–Map	193	0.19	.19	11.50**	0.05	2574.89**
PAp–Pav	147	0.42	.40	20.62**	0.06	2943.55**
PAp–Mav	37	0.18	.18	7.97**	0.02	219.01**
MAp–Pav	141	−0.01	−.01	−0.52	0.03	1329.12**
MAp−MAv	37	0.24	.24	9.23**	0.02	285.99**
PAv−MAv	36	0.33	.31	14.53**	0.01	234.54**
Reliabilities						
PAp	195	1.25	.85	63.24**	0.07	5297.65**
PAv	143	1.09	.80	69.24**	0.03	1825.80**
MAp	189	1.21	.84	14.83**	0.04	4009.99**
MAv	34	1.09	.80	26.02**	0.06	495.81**

Note. Results in the *d* metric are effect size estimates produced by the hierarchical linear modeling program. Results in the *r* metric are restricted to range [−1, 1] and can be interpreted as correlation coefficients. Coefficients can be transformed from the *d* to *r* metric via Equation 6 or from *r* to *d* via Equation 1. The variance component, with its associated $\chi^2(1)$ test, can be interpreted as a measure of heterogeneity of effect sizes between studies, in the same spirit as the *Q* statistic test in conventional fixed-effects meta-analysis. In other words, a significant variance component for a particular correlation indicates that there is significant residual (unexplained) heterogeneity in the correlation across studies. PAp = performance-approach; PAv = performance-avoidance; MAp = mastery-approach; MAv = mastery-avoidance.
* $p < .05$. ** $p < .01$.

reference category and contrasted with mastery-improve/mastery-task and mastery-fear.

Additional moderators. We included an additional set of moderators that had been hypothesized in the literature as possibly moderating achievement goal relationships (e.g., grade, gender) or that are generally used in meta-analytic reviews. Gender was defined as the proportion of the study sample that was female and could range from 0 to 1. Grade in school was coded into six levels: elementary school (coded as 0), middle school (1), high school (2), undergraduate–introductory psychology (3), undergraduate–other (4), and graduate (5). On the basis of previous meta-analytic reviews (e.g., Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006), we categorized the ethnicity of the sample into a binary dummy variable that represented the percentage of the sample that was White (0 = less than 85% or unspecified, 1 = at least 85%). Nationality was coded into three binary dummy variables with United States/Canada as the reference group and either Europe, Asia, or other (e.g., Australia, Israel) as the comparison group. Achievement domain was coded into four binary dummy variables with classroom education as the reference group and either sports, work, social (e.g., interpersonal relationships with friends or peers), or other (e.g., computer games, IQ test items) as the comparison group. Publication status was coded into a dummy variable (0 = unpublished or conference presentation, 1 = peer-reviewed publication).

Calculation of Effect Sizes

Traditionally, researchers conducting meta-analysis for correlational data have employed a fixed-effects model in which the correlations from each study are (a) weighted by a function of their sample size, (b) transformed (Hedges & Olkin, 1985; Rosenthal & Rubin, 1982) or not (Hunter & Schmidt, 1990), and finally (c) averaged to produce an estimate of the population effect size. However, some researchers (e.g., Field, 2001; Hunter & Schmidt, 2000) recently have argued for the use of random-effects methods in meta-analysis. This approach accounts for heterogeneity between studies and anchors the statistical analyses within a framework that allows researchers to generalize results beyond the set of studies selected for inclusion in the meta-analysis. In line with this argument, we explicitly adopted a random-effects framework by using hierarchical linear modeling (HLM) methods to synthesize the available data. Analyses of achievement goal reliabilities, intergoal correlations, and goal–outcome correlations were conducted in HLM, Version 6.04 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004) via the following procedure:

1. In keeping with the recommendations of Hedges and Olkin (1985), we converted all correlations r_j to level-1 effect size estimators d_j using Fisher's r-to-Z transformation:

$$d_j = [.5] \log[(1 + r_j)/(1 - r_j)], \quad (1)$$

with corresponding fixed level-1 variance

$$V_j = 1/(n_j - 3), \quad (2)$$

where n_j is the sample size of study j.

2. The effect sizes $\{d_j\}$ became the outcome in a hierarchical linear model, as follows:

$$\text{At level 1, } d_j = x\beta_0 + V_j \quad (3)$$

$$\text{and at level 2, } \beta_0 = \gamma_0 + U_0. \quad (4)$$

Note that although the level-1 variance was fixed as a function of each study's sample size, the level-2 random effects variance was estimated with the HLM procedure. This allowed us to determine whether for each correlation there was unexplained variance at the study level and provided the impetus for conducting moderator analyses in cases in which significant between-study variation was found.

3. Subsequent moderator analyses were conducted simply by inclusion of potential moderators as predictors at level 2:

$$\beta_0 = \gamma_0 + \gamma_1 * (\text{PREDICTOR1}) + \ldots + U_0. \quad (5)$$

Significance of any level-2 predictor is an indication that the level-1 intercept (average) of a given correlation systematically changes as a function of that predictor and is thus evidence that the predictor moderates the correlation under consideration.

4. Within the text, all results are presented on the correlation metric. Effect size estimates were reconverted to correlations by the inverse of the Fisher transformation:

$$\hat{r} = [\exp(\hat{\gamma}_0) - 1]/[\exp(\hat{\gamma}_0) + 1]. \quad (6)$$

Results

The analyses are divided into three subsections. First, we present descriptive statistics for the studies we analyzed (see Tables 7–9). Second, we present analyses of the overall correlations (goal–outcome and goal–goal) and reliabilities using the unconditional HLM model (Equations 3 and 4; see Table 10 for overall results and Table S1 of the supplemental material for complete moderator results). Third, we conducted analyses with individual moderators entered at Level 2 to examine whether we could explain the heterogeneity in correlations across studies (i.e., unexplained Level-2 variance; Equation 5). The first set of moderator analyses focused on the achievement goal construct moderators (see Tables 11–13 and S2 and S3), and the second set focused on additional moderators. In each stage of our analyses, we included as many studies as possible for each correlation. Because not every study contained every correlation (e.g., the MAp–performance correlation) or moderator variable (e.g., gender of participants), there was considerable variability in the number of studies available for each analysis. Thus, each analysis used slightly different subsamples of studies from the overall sample (K = 243).

Descriptive Statistics

The final data set contained 243 studies with 91,087 total participants. For the 208 studies that reported gender of the participant, 58% of the 82,585 participants were female and 42% were male. In terms of nationality, the preponderance of studies used U.S. or Canadian samples (k = 136), as compared with European (k = 37), Asian (k = 19), or another nationality (k = 12). Although only half of the studies reported participant race (k = 122), the majority of these reported samples that were less than 85% White (k = 95). Education was the most common achievement domain (k = 201, 87%), compared with sports (k = 10), work (k = 7),

Table 11
Summary Table of Significant Moderators

"Outcome" correlation	Goal scale type	Percentage goal-relevant	Majority scale code	Gender	Grade	Ethnicity	Nationality	Achievement domain	Publication status
Performance outcomes and									
PAp	X	X	X						
PAv	X						X		
MAp		X	X				X		X
MAv							X		X
Interest and									
PAp					X				
PAv	X	X							
MAp	X	X							
MAv									
Correlations									
PAp–MAp	X	X		X	X		X	X	
PAp–PAv	X	X	X					X	X
PAp–MAv	X	X	X		X		X		
MAp–PAv	X	X	X		X		X	X	
MAp–MAv			X						
PAv–MAv					X				
Reliabilities									
PAp	X	X	X				X		
PAv						X			X
MAp	X	X	X					X	
MAv	X						X		X
Total (%)	11 (61)	10 (56)	8 (44)	1 (6)	5 (28)	1 (6)	8 (44)	4 (22)	5 (28)

Note. PAp = performance-approach; PAv = performance-avoidance; MAp = mastery-approach; MAv = mastery-avoidance.

social ($k = 5$), or other ($k = 9$). In most studies that focused on the educational domain, participants were undergraduate students ($k = 142$), as compared with elementary ($k = 20$), middle ($k = 38$), or high school ($k = 22$) students (see Table 7).

As presented in Figure 1, for each goal, there was remarkable diversity in the items. No single construct emerged as predominant for any goal except MAv, which was largely fear-oriented. This heterogeneity in measurement is demonstrated in Table 7, which presents the descriptive statistics of percentage goal type (i.e., the percentage of items in a given scale that were relevant to that achievement goal). Only the performance-approach scales contained more than 50% goal-relevant items on average. Similarly, the frequencies of the majority scale codes (in which a label was assigned to the scale if half or more of the items fit one category) also reflected this diversity in measurement. As presented in Table 8, the only type of majority scale code used in over half of the studies was the fear-based scales for mastery-avoidance goals.

The relative diversity of each kind of goal can be represented by the number of different types of items in each scale. Conceptually, if a scale has a greater number of item types, then it hypothetically is capturing different components of each achievement goal. As presented in Table 9, the omnibus chi-square test indicated that there were significant differences among the four achievement goals in terms of the distribution of the number of items they comprised, $\chi^2(9) = 254.46$, $p < .01$. Specifically, mastery-approach goal scales can be considered the most diverse, being significantly more likely than any other goal scale to contain four or more item types and significantly less likely than performance-approach or mastery-avoidance scales to contain only one item type. Mastery-avoidance scales were measured with the most

Table 12
Expected Correlation Values for Goal Scale Type Moderator Analyses

	Performance outcomes and				Interest and			
Goal scale type	PAp	PAv	MAp	MAv	PAp	PAv	MAp	MAv
Overall	.06	−.13	.11	−.12	.07	−.07	.44	−.06
AGQ	*.13*	*−.20*	.09	−.10	.02	*−.20*	*.38*	−.08
PALS	*−.01*	*−.13*	.08	—	.08	*−.05*	*.57*	—
Other published	*.01*	*−.08*	.11	—	.06	*−.11*	*.45*	—
Custom	*−.02*	*−.09*	.14	−.15	.13	*−.02*	*.39*	−.04

Note. Values represent expected correlations from the hierarchical linear modeling analyses ($\hat{r}$). Italicized values indicate that the moderator analysis was significant at $p < .05$ for at least one predictor in the set of dummy variables. Dashes indicate that the moderator analysis was not conducted for that correlation. PAp = performance-approach; PAv = performance-avoidance; MAp = mastery-approach; MAv = mastery-avoidance; AGQ = Achievement Goals Questionnaire; PALS = Patterns of Adaptive Learning Survey.

Table 13
Expected Correlation Values for Majority Scale Code Moderator Analyses

Majority scale code	Correlations with: Performance outcomes	Correlations with: Interest
Overall	.06	.07
Performance-approach		
Normative	*.14*	.08
Appearance/evaluative	*−.14*	—
No goal	*.01*	.00
No clear majority	*.03*	.09
Mastery-approach		
Potential	*.03*	.40
Task/improve	*−.10*	—
General	*.20*	—
No goal	*.10*	.52
No clear majority	*.09*	.48

Note. Values represent expected correlations from the hierarchical linear modeling analyses (r̂). Italicized values indicate that the moderator analysis was significant at $p < .05$ for at least one predictor in the set of dummy variables. Dashes indicate that the moderator analysis was not conducted for that correlation.

consistency in the studies in our sample, as they were more likely than any other scale to contain only one item type.

Overall Analyses of Correlations and Reliabilities

Table 10 presents the overall achievement goal scale correlations and reliabilities for all of the studies included in this meta-analysis.

Goal-outcome correlations. The approach scales were positively correlated with performance outcomes, $\hat{r}_{PAp} = .06$, $t(97) = 5.24$, $p < .01$; $\hat{r}_{MAp} = .11$, $t(94) = 8.55$, $p < .01$, whereas both avoidance scales were negatively correlated with performance outcomes, $\hat{r}_{PAv} = -.13$, $t(62) = -8.43$, $p < .01$; $\hat{r}_{MAv} = -.12$, $t(11) = -5.34$, $p < .01$. The number of studies ranged from 12 for the MAv–performance outcome correlation to 98 for the PAp–performance outcome correlation and included from 4,519 to 31,539 participants, respectively. Interest and mastery-approach goals were positively correlated, $\hat{r} = .44$, $t(51) = 15.98$, $p < .01$; interest and performance-approach goals were positively correlated, $\hat{r} = .07$, $t(51) = 4.11$, $p < .01$; and interest was slightly negatively correlated with the avoidance scales, $\hat{r}_{PAv} = -.07$, $t(33) = -2.87$, $p < .01$; $\hat{r}_{MAv} = -.06$, $t(8) = -1.83$, $p = .10$. The number of studies ranged from 9 for the MAv–interest correlation to 52 for the PAp–interest and MAp–interest correlations and included from 3,378 to 15,841 participants, respectively.

Goal–goal correlations. As illustrated in Table 10, all of the goal scales exhibited small to moderate intercorrelations with the exception of mastery-approach and performance-avoidance goals, $\hat{r} = -.01$, $t(140) = -0.52$, $p = .60$. The strongest correlation was between performance-approach and performance-avoidance goals, $\hat{r} = .40$, $t(146) = 20.62$, $p < .01$. The number of studies ranged from 36 for the MAv–PAv correlation to 193 for the MAp–PAp correlation and included from 19,837 to 74,891 participants, respectively.

Scale reliabilities. Overall, the average reliabilities for the four goal scales were good: performance-approach, $\hat{\alpha} = .85$; mastery-approach, $\hat{\alpha} = .84$; performance-avoidance, $\hat{\alpha} = .80$; and mastery-avoidance, $\hat{\alpha} = .80$. The number of studies for each reliability analysis ranged from 34 for mastery-avoidance goals to 195 for performance-approach goals and included from 19,307 to 74,288 participants, respectively. These results indicate that the achievement goal scales appear to be adequately reliable on average.

Summary. According to these broad correlations, across all components and item types for mastery and performance goals, approach goals were positively correlated with performance outcomes and interest, whereas avoidance goals were negatively correlated. All of the intercorrelations are moderately sized, with

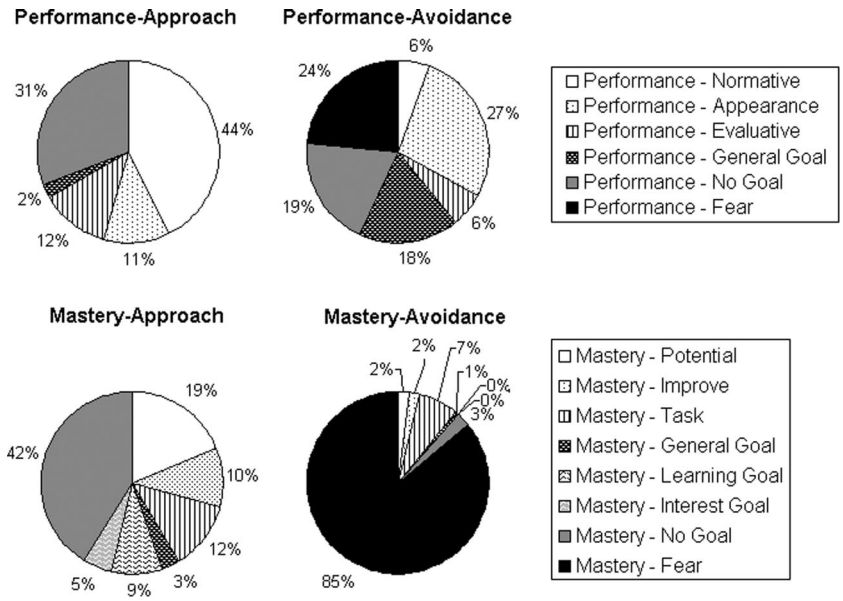

Figure 1. Item code frequencies.

only the correlation between performance-approach and performance-avoidance goals being above .40. All four goal scales appear to be fairly reliable with overall estimates all greater than .80. However, the descriptive analysis of achievement goal construct moderators reveals considerable variability in measurement, as well as in other study characteristics such as grade and nationality, and the amount of level-2 variance (i.e., heterogeneity) was significant for every correlation and reliability (see Table 10). In the moderator analyses presented next, we investigated whether the inconsistency in measurement and other study characteristics impacted these overall correlations.

Because all predicted reliabilities were of adequate magnitude (>.70) even after accounting for the effects of potential moderators, the focus of the moderator analyses presented here was on only intergoal and goal–outcome correlations. A list of predictors that significantly moderated each achievement goal reliability is included in Table 11, and the full results of the reliability moderator analyses may be found in Table S1 of the supplementary material.

Achievement Goal Construct Moderators

Our primary purpose in conducting the moderator analyses was to examine whether the heterogeneity in correlations across studies could be explained by the moderator variables. As noted in Table 10, there was significant unexplained variability in all of the correlations reported in our baseline analyses. Theoretically, we were interested in how different conceptualizations and measurement of the achievement goal constructs, as operationalized by our item coding categories (e.g., percentage goal type, majority scale code) and scale types (e.g., PALS, AGQ, and so forth), accounted for variability in correlations across studies. For each moderation analysis, one moderator was entered as a predictor in level 2 of the model (see Equation 5), and significance tests associated with the predictor indicated whether the addition of the moderator significantly changed the expected value of the correlation. The significant results for the achievement goal construct moderator analyses are presented in the following text and in Tables 11, 12, and 13 (complete moderator results may be found in Table S1 in the supplementary online material). The results for the majority scale code moderator analyses will only be presented for approach goals due to data restrictions with the avoidance goals: For performance-avoidance goals, there were too few studies that reported PAv correlations and a complete set of scale items to code, and for mastery-avoidance goals, there was a lack of variability in scale codes as virtually all of the scales (92%) were coded as mastery-fear.

Goal–outcome correlations. The goal scale type moderator analysis indicated that studies in which the AGQ ($\hat{r} = .13$) was used reported significantly higher PAp–performance outcome correlations than those in which the PALS ($\hat{r} = -.01$), $t(94) = -3.97$, $p < .01$, or another published scale ($\hat{r} = .01$), $t(94) = -3.56$, $p < .01$, was used. The percentage goal type moderator analysis indicated that PAp–performance outcome correlation increased from an expected $\hat{r} = -.02$ when none of the items in the goal scale were coded as performance-approach to $\hat{r} = .10$, $t(65) = 3.37$, $p < .01$, when all of the items were coded as performance-approach. The majority scale code moderator analysis indicated that studies coded as performance-normative reported significantly more positive PAp–performance outcome correlations ($\hat{r} = .14$) than those coded as performance-appearance/evaluative ($\hat{r} = -.14$), $t(59) = -4.94$, $p < .01$, or performance–no goal ($\hat{r} = .01$), $t(59) = -5.54$, $p < .01$), or those without a clear majority ($\hat{r} = .03$), $t(59) = -3.61$, $p < .01$. There were no significant achievement goal construct moderators of the PAp-interest correlation.

For the PAv–performance outcome correlation, the goal scale type moderator analysis indicated that studies in which the AGQ ($\hat{r} = -.20$) was used reported significantly more negative PAv–performance outcome correlations than those in which a custom scale ($\hat{r} = -.09$), $t(59) = 2.91$, $p < .01$, or a published scale other than the AGQ or PALS ($\hat{r} = -.08$), $t(59) = 2.40$, $p < .05$, was used. For the PAv-interest correlation, the goal scale type moderator analysis indicated that studies in which the AGQ ($\hat{r} = -.20$) was used reported significantly more negative PAv-interest correlations than those in which the PALS ($\hat{r} = -.05$), $t(30) = 2.29$, $p < .05$, or a custom scale ($\hat{r} = -.02$), $t(30) = 2.80$, $p < .01$, was used. The percentage goal type moderator analysis indicated that PAv-interest correlation became significantly less negative as the percentage of items coded as performance-avoidance increased from no PAv items ($\hat{r} = -.13$) to all PAv items ($\hat{r} = .03$), $t(17) = 2.20$, $p < .01$.

For the MAp–performance outcome correlation, the percentage goal type moderator analysis indicated that MAp–performance outcome correlation decreased from an expected $\hat{r} = .14$ when none of the items in the goal scale were coded as mastery-approach to $\hat{r} = .05$ when all of the items were coded as mastery-approach, $t(64) = -2.64$, $p < .05$. This result is corroborated by the majority scale code analysis, which revealed that significantly higher MAp-performance outcome correlations were expected in studies with goal scales coded as majority no goal ($\hat{r} = .10$), $t(57) = 2.61$, $p < .05$, and studies without a clear majority code ($\hat{r} = .09$), $t(57) = 2.03$, $p < .05$, than in studies with goal scales coded as majority mastery-potential ($\hat{r} = .03$). For the MAp-interest correlation, the goal scale type moderator analysis indicated that studies in which the PALS ($\hat{r} = .57$) was used reported significantly more positive MAp-interest correlations than those in which the AGQ ($\hat{r} = .38$), $t(48) = 2.72$, $p < .05$, was used. The percentage goal type moderator analysis indicated that MAp-interest correlation decreased from the expected $\hat{r} = .58$ when none of the items in the goal scale were coded as mastery-approach to $\hat{r} = .35$ when all of the items were coded as mastery-approach, $t(33) = -3.44$, $p < .01$.

Goal–goal correlations. For the PAp–PAv correlation, the goal scale type moderator analysis indicated that studies in which the AGQ ($\hat{r} = .31$) was used had significantly lower PAp–PAv correlations than those in which the PALS ($\hat{r} = .49$), $t(142) = 4.05$, $p < .01$, or a custom scale ($\hat{r} = 0.43$), $t(142) = 2.74$, $p < .01$, was used. The percentage goal type moderator analysis indicated that the expected PAp–PAv correlation increased from $\hat{r} = .29$ when none of the items in the PAv goal scale were coded as performance-avoidance to $\hat{r} = .52$ when all of the PAv items were coded as performance-avoidance, $t(110) = 5.77$, $p < .01$. The performance-approach majority scale code moderator analysis indicated that studies whose PAp items were coded as performance-normative ($\hat{r} = .34$) reported significantly lower PAp–PAv correlations than studies with PAp items primarily coded as performance-appearance/evaluative ($\hat{r} = .71$), $t(113) = 7.00$, $p <$

.01, and studies with no clear majority of PAp items ($\hat{r} = .50$), $t(113) = 3.73$, $p < .01$.

For the PAp–MAp correlation, the goal scale type moderator analysis indicated that studies in which the AGQ ($\hat{r} = .21$) was used had significantly higher PAp–MAp correlations than those in which another published scale ($\hat{r} = .10$), $t(188) = -2.42$, $p < .05$, was used. The percentage goal type moderator analysis indicated that the expected PAp–MAp correlation increased from $\hat{r} = .11$ when none of the PAp items in the goal scale were coded as performance-approach to $\hat{r} = .21$ when all of the PAp items were coded as performance-approach, $t(144) = 2.14$, $p < .05$.

For the PAp–MAv correlation, the goal scale type moderator analysis indicated that studies in which the AGQ ($\hat{r} = .14$) was used had significantly lower PAp–MAv correlations than those in which the PALS ($\hat{r} = .45$), $t(34) = 3.14$, $p < .01$, or a custom scale ($\hat{r} = .23$), $t(34) = 2.36$, $p < .05$, was used. The percentage goal type moderator analysis indicated that PAp–MAv correlation deceased from an expected $\hat{r} = .43$ when none of the PAp items in the goal scale were coded as performance-approach to $\hat{r} = .15$ when all of the PAp items were coded as performance-approach. The performance-approach majority scale code analysis indicated that studies with a majority of performance-normative items reported significantly lower PAp–MAv correlations ($\hat{r} = .15$) than studies with no clear majority of items ($\hat{r} = .38$), $t(29) = 2.66$, $p < .05$.

For the MAp–PAv correlation, the goal scale type moderator analysis indicated that studies in which a published scale other than the AGQ or PALS ($\hat{r} = -.17$), $t(136) = -3.64$, $p < .01$, was used had significantly more negative MAp–PAv correlations than those in which the AGQ ($\hat{r} = .02$) was used. The percentage goal type moderator analysis indicated that the expected MAp–PAv correlation was more positive when all of the MAp items were coded as mastery-approach ($\hat{r} = .08$) compared with when none of the items were coded as mastery-approach ($\hat{r} = -.13$), $t(112) = 5.04$, $p < .01$. The mastery-approach majority scale code moderator analysis indicated that studies coded as majority no goal ($\hat{r} = -.14$) had significantly more negative MAp–PAv correlations than those coded as mastery-potential ($\hat{r} = .04$), $t(109) = -4.06$, $p < .01$. No achievement goal construct predictors significantly moderated the MAp–MAv or PAv–MAv correlations.

Summary. As presented in Table 11, the three achievement goal construct moderators (goal scale type, percentage goal-relevant language, and majority scale code) significantly affected 29 of 54 possible relationships (54%). Performance-approach goals were the most frequently affected, with 14 of the 18 (78%) possible relationships moderated by one of the three achievement goal construct moderators, followed by mastery-approach with 13 (72%), performance-avoidance goals with nine (50%), and mastery-avoidance with only four (22%). As presented in Tables 12 and 13, relationships between PAp goals and performance outcomes were positive when the AGQ or normatively worded items were used and negative when appearance-evaluative items were used. Relationships between PAv goals and both performance outcomes and interest were significantly more negative with the AGQ than with PALS or custom scales or with scales in which less goal-relevant language was used. Relationships between MAp goals and performance outcomes were significantly greater than zero when measured with non-goal-relevant language, and they were reduced to zero when the scales contained predominantly goal-relevant language. Relationships between MAp goals and interest were stronger with the PALS than with other scales, but all scales showed strong positive relationships between MAp goals and interest. For the goal–goal correlations, PAp–PAv correlations were significantly smaller with the AGQ rather than the PALS and with normative rather than appearance-evaluative items. PAp–MAp correlations increased slightly the AGQ was used and when goal-relevant language was used.

Additional Moderators

We examined several additional moderators of achievement goal correlations, specifically gender, grade in school, ethnicity, nationality, achievement domain, and publication status. Table 11 presents a summary of the moderator analyses.

Goal–outcome correlations. There were no significant additional moderators of the PAp–performance outcome correlation. However, the grade level of participants was a significant moderator of the PAp–interest correlation, $t(47) = -2.84$, $p < .01$, indicating that this correlation was expected to decrease from elementary school ($\hat{r} = .20$) by an average of .04 per additional grade level. No other predictors significantly moderated the PAp–interest correlation.

For the PAv–performance outcome correlation, the nationality moderator analysis indicated that the PAv–performance outcome correlation was significantly more positive in Asian samples ($\hat{r} = .11$) than in samples classified as U.S. or Canadian ($\hat{r} = -.14$), $t(50) = 2.21$, $p < .05$. There were no significant additional moderators of the PAv–interest correlation.

For the MAp–performance outcome correlation, the nationality of the sample was a significant moderator, $t(74) = 2.16$, $p < .05$, indicating that European samples ($\hat{r} = .20$) demonstrated significantly higher MAp–performance outcome correlations than samples classified as U.S. or Canadian ($\hat{r} = .11$). Publication status was a significant moderator, $t(88) = 2.42$, $p < .05$, indicating that the MAp–performance outcome correlation was more positive in published ($\hat{r} = .13$) than unpublished ($\hat{r} = .06$) studies. There were no significant additional moderators of the MAp–interest correlation.

For the MAv–performance outcome correlation, the nationality of the sample was a significant moderator, $t(8) = 2.66$, $p < .05$, indicating that U.S. or Canadian samples ($\hat{r} = -.15$) had negative expected MAv–performance outcome correlations, whereas there was no expected relationship between MAv endorsement and performance outcomes for European samples ($\hat{r} = .01$). Publication status was a significant moderator, $t(10) = 2.81$, $p < .05$, indicating that the MAv–performance outcome correlation was less negative in published ($\hat{r} = -.02$) than unpublished ($\hat{r} = -.14$) studies. There were no additional moderators of the MAv–interest correlation.

Goal–goal correlations. For the PAp–PAv correlation, the achievement domain moderator analysis indicated that studies focusing on social goals ($\hat{r} = .68$) reported higher PAp–PAv correlations than studies focusing on educational goals ($\hat{r} = .39$), $t(134) = 3.60$, $p < .01$. Publication status was a significant moderator, $t(140) = -4.00$, $p < .01$, indicating that the PAp–PAv correlation was smaller in published ($\hat{r} = .35$) than in unpublished ($\hat{r} = .49$) studies.

For the PAp–MAp correlation, gender was a significant moderator, $t(164) = -3.10$, $p < .01$, indicating that the expected PAp–MAp correlation would be significant in all male samples ($\hat{r} = .39$) and nearly zero in all female samples ($\hat{r} = .02$). The grade level of participants was a significant moderator, $t(182) = -4.80$, $p < .01$, indicating that the PAp–MAp correlation decreased by approximately .05 per increase in grade level, with the peak correlation (among elementary school students) at $\hat{r} = .32$. The nationality moderator analysis indicated that Asian ($\hat{r} = .43$), $t(158) = 5.63$, $p < .01$, and European ($\hat{r} = .30$), $t(158) = 3.55$, $p < .01$, samples evinced significantly higher PAp–MAp correlations than those classified as U.S. or Canadian ($\hat{r} = .15$). The achievement domain moderator analysis indicated that studies conducted in educational domains ($\hat{r} = .20$) reported significantly higher PAp–MAp correlations than studies conducted in work domains ($\hat{r} = -0.04$), $t(180) = -2.79$, $p < .01$.

For the PAp–MAv correlation, the grade level of participants was a significant moderator, $t(33) = 3.17$, $p < .01$, indicating that the PAp–MAv correlation increased from elementary school students ($\hat{r} = -.08$) by an average of .07 per additional grade level. The nationality moderator analysis indicated that Asian samples ($\hat{r} = .37$) had significantly higher PAp–MAv correlations than those classified as U.S. or Canadian ($\hat{r} = .17$), $t(31) = 2.16$, $p < .05$.

For the MAp–PAv correlation, the grade level of participants was a significant moderator, $t(134) = -3.30$, $p < .01$, indicating that the MAp–PAv correlation decreased from elementary school students ($\hat{r} = .10$) by an average of .06 per additional grade level. The nationality moderator analysis indicated that U.S. or Canadian samples ($\hat{r} = -.03$) had lower MAp–PAv correlations than samples classified as European ($\hat{r} = .08$), $t(116) = 2.46$, $p < .05$, or Asian ($\hat{r} = .12$), $t(116) = 2.78$, $p < .01$, and higher MAp-PAv correlations than samples composed of other nationalities ($\hat{r} = -.20$), $t(116) = -1.98$, $p < .05$. The achievement domain moderator analysis indicated that studies in work domains ($\hat{r} = -.20$), $t(129) = -2.57$, $p < .05$, reported significantly more negative MAp–PAv correlations than studies conducted in educational domains ($\hat{r} = .00$).

For the PAv–MAv correlation, participants' grade level was a significant moderator of the PAv–MAv correlation, $t(32) = 3.00$, $p < .01$, indicating that the PAv–MAv correlation was expected to be weakest among elementary students ($\hat{r} = .08$) and to increase approximately .07 with each increase in grade level.

Summary. As presented in Table 11, the additional moderator analyses indicated that nationality of the sample was the most consistent moderator of achievement goal correlations and reliabilities (eight of 18 relationships, 44%). Nationality also moderated three of the four relationships with performance outcomes. Performance-approach goals were again the most frequently affected achievement goal, with 10 of 30 (33%) relationships moderated by one of the six additional moderators, followed by performance-avoidance with nine (30%), mastery-approach with eight (27%), and mastery-avoidance with seven (23%). For the goal–outcome correlations, younger children exhibited stronger PAp–interest, PAp–MAp, and MAp–PAv correlations, whereas older samples exhibited stronger PAv–MAv correlations. European samples showed more positive MAp–performance outcome correlations and PAp–MAp correlations than U.S. or Canadian samples. Also, U.S. and Canadian samples had more negative MAv–performance outcome correlations than European samples (which showed no relationship), and Asian samples showed positive PAv–performance outcome correlations (compared with negative correlations for U.S. and Canadian samples) and more positive goal–goal correlations. In published studies, significantly positive MAp–performance outcome correlations and negative MAv–performance outcome correlations were reported, whereas in unpublished studies, both types of correlations averaged zero. Published studies also reported less positive PAp–PAv correlations.

Discussion

In this meta-analysis, we addressed the question of whether achievement goal researchers are using different labels for the same constructs or are putting the same labels on different constructs. We systematically reviewed 243 extant studies comprising 91,087 participants published through 2006 and examined the extent to which conceptual and methodological differences in the measurement of achievement goals moderated achievement goal intercorrelations and relationships with outcomes. Our results indicate that conceptual and measurement differences do exist and that they moderate the relationship between achievement goals and outcomes, with clear implications for theory and future research. Clearly, achievement goal researchers are using the same label for different constructs. The discrepancy between conceptual and operational definitions and the absence of goal-relevant language in achievement goal measures are major roadblocks for productive theory testing, research synthesis, and practical application.

Construct Validity

Construct validity consists of two pieces: conceptual clarity and measurement (i.e., operational) consistency (Shadish et al., 2002; Trochim, 2006). Without adequate conceptualization, achievement goal measures may be perfectly reliable, but they may not measure the intended construct. It is only when constructs have been adequately defined and measured that we can make valid inferences to theory (Barron et al., 2008; Campbell, 1969). Our review clearly indicates that there is a lack of both conceptual and operational consistency, which has resulted in an overall misalignment between theory and measurement.

We identified the primary components of each kind of achievement goal studied in the literature, and we found considerable variability in the measurement of these components both between and within studies. Mastery-approach goals exemplify this variability, with nearly 60% of the instruments tapping three or more types of items—some goal-relevant and others not—within a single scale. Performance-approach goal scales also demonstrate this variability but to a lesser degree, as the scales used to measure PAp goals were as likely to contain only one type of item as they were to contain three. By itself, variability in the operationalization of achievement goals is not necessarily a problem, so long as the items used to assess goal endorsement all correspond to the same underlying construct. Complications can arise, however, when different theoretical conceptions and measurement tools are assumed to represent the same constructs but in fact contain different components that may represent a host of underlying constructs. This problem is magnified when the components are differentially associated with outcomes, which can lead to confusion and dis-

agreements in the field. This is precisely what we found in our meta-analytic review. In short, our review of the measures indicates that achievement goal researchers appear to be using the same broad labels for functionally different constructs.

Our review illustrates the discrepancy between theory and measurement in two ways. First, although achievement goals have been conceptually and empirically distinguished from achievement needs (e.g., mastery and performance goal strivings are proposed to be, in part, situation-specific expressions of the need to achieve competence in general; Dweck, 1986; Harackiewicz & Sansone, 1991; Nicholls, 1984), our review indicates that achievement goal researchers have not consistently distinguished the goal construct from its achievement motive roots in their measurement of achievement goals. For example, a large percentage of items did not contain goal-relevant language at all: 29% of PAp, 64% of PAv, 52% of MAp, and 92% of MAv goal items did not refer to goal striving (i.e., they did not contain goal-relevant language). In fact, the content of the mastery-approach items was better characterized by the absence of goal-relevant language than the presence, which calls the goal measure into question. Instead, these items assess more general, traitlike constructs such as preference for challenge and interest in learning in general. Moreover, the avoidance goal items (both mastery and performance) rely heavily on negative affectivity. Elliot has since updated the Avoidance subscales of the AGQ to remove the negative affectivity and thus closer align the items with the theoretical achievement goal constructs (Elliot & Murayama, 2008). The PALS scales have never had this issue (see Anderman et al., 2003, for an historical review of the PALS scales). Our study underestimates the degree of nongoal items used to measure achievement goals in the literature. This is because our initial screening excluded studies that contained only nongoal items. If these studies had been included, the percentage of items coded as no goal would have increased.

Second, the main components of the four achievement goals that emerged from our review of achievement goal measurement did not match any single theoretical perspective in the achievement goal literature: task, potential, and improvement for mastery-approach; normative and appearance for performance-approach; appearance and fear for performance-avoidance; and fear for mastery-avoidance. Although these components reflect some of the original components of achievement motivation (e.g., work by researchers such as Lewin, McClelland, Atkinson, and Murray), they do not match any single current achievement goal framework. Thus, the absence of goal-relevant language and the discrepancy between conceptual and operational definitions are major roadblocks for productive theory testing and research synthesis for achievement goal researchers.

Measurement Matters

Although the achievement goal scales demonstrated good overall reliability (all $\hat{\alpha}$s $> .80$), variability in construct operationalization (i.e., item types) was associated with differences in achievement goal intercorrelations and relationships with educational outcomes. In other words, how goals were measured had important consequences. Most notably, the relationships between approach goals and performance outcomes varied significantly according to the type of item used to measure the goals. For performance-approach goals, studies in which the AGQ was used showed significantly higher correlations with performance outcomes than those in which the PALS was used. The type of item used in each scale may partially explain this difference—the AGQ's performance-approach subscale is dominated by goal-relevant items, whereas the PALS's is characterized by nearly equal numbers of goal and non-goal-relevant items (see Tables S2 and S3 in the supplemental online materials). For example, of the 63 studies that reported a PAp-performance outcome correlation, 18 used the AGQ and 12 used the PALS to measure performance-approach goals. For all 18 of the AGQ studies (100%), a majority of items in the scale were normatively referenced, whereas none of the 12 measures used in the PALS studies (0%) had a majority of normative items. Instead, the majority of the items in the PALS scales were more likely to be coded as no goal (50%) than as appearance/evaluative (17%) or no clear majority (33%).[5]

In addition, normatively coded performance goal scales had a positive correlation with performance outcomes, whereas scales with a majority of appearance and evaluative items had a negative relationship. These differences in performance-approach goal measurement might explain why some researchers have suggested that performance-approach goals can be adaptive in some classrooms (e.g., Harackiewicz et al., 1998), whereas other researchers have been skeptical of their value (e.g., Midgley et al, 2001). Researchers who consider the potential benefits of performance-approach goals and adopt the multiple goals perspective have tended to use more normatively referenced PAp items (e.g., AGQ), whereas those who are more critical of performance-approach goals have tended to use more appearance-relevant language (e.g., PALS). In addition, the composition of the AGQ and PALS has changed over time to become more or less normative, respectively (see Figure 2), which can partially explain the differences in opinion regarding the role of performance-approach goals in education.

Rather than debate the relative merits of performance-approach goals in educational contexts, it might be more productive for achievement goal researchers to consider *why* appearance-framed performance-approach goals have negative relationships with performance outcomes whereas normatively-framed performance-approach goals have positive relationships, and whether both appearance and normative components belong within the performance goal construct (cf. Hulleman & Senko, 2010). For example, Elliot and colleagues consistently have found that performance-approach goals are associated with both the need for achievement and fear of failure (e.g., Elliot & Church, 1997; Elliot & McGregor, 2001). As such, these goals are multifaceted, and the approach component could be fueled by outdoing others (need for achievement), producing the positive effects observed in many studies, or by fear of failure (just wanting to not fail), producing more negative effects. Additionally, the appearance component of performance goals is conceptually similar to the self-worth contingency perspective of Covington (2000) and Crocker and Park (2004). These authors have argued that whenever an individual's self-worth becomes too closely tied to task outcomes, maladaptive responses are evidenced, such as anxiety, shame, and impaired performance (e.g., Covington, 1984; Covington & Omelich, 1985; Crocker & Park, 2004; Park,

[5] As we discuss later, there is a potential confound between grade and the AGQ scale that could explain these differences in results.

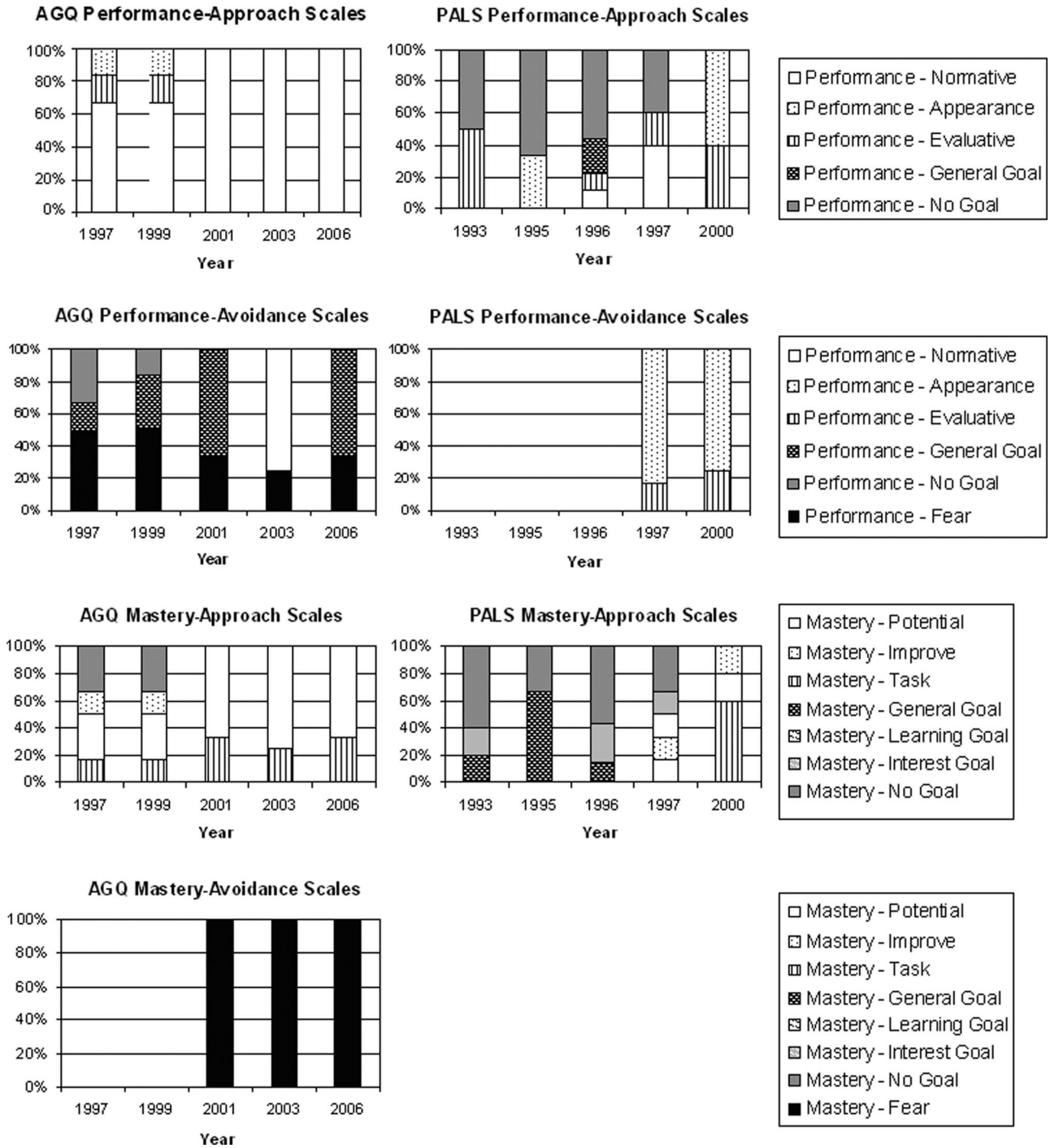

Figure 2. Change in composition of the Achievement Goals Questionnaire (AGQ) and Patterns of Adaptive Learning Survey (PALS) over time.

Crocker, & Kiefer, 2007). The maladaptive emotional response associated with the appearance/self-worth component of performance-approach goals could explain the negative relationship with performance. Further explorations of the relationship between the appearance component of performance goals and self-worth contingencies are needed.

Despite the apparent consensus regarding the conceptualization of mastery goals, there was considerable variability in the measurement of mastery-approach goals. This variability in measurement subsequently influenced the observed relationship between mastery goals and outcomes. For example, the correlation between mastery-approach goals and performance outcomes was

maximized when none of the scale items used goal-relevant language ($\hat{r} = .14$) and dropped significantly when all of the items in the scale used goal-relevant language ($\hat{r} = .05$). If non-goal-related components and processes are more strongly associated with performance outcomes than are mastery-approach goals themselves, what are the implications for achievement goal theory? Further research could shed light on whether the correlation between performance outcomes and mastery goal scales that lack goal language is better explained by personality processes and individual differences (e.g., preference for challenge and novelty, openness to experience and feedback) rather than the goal striving process per se.

The correlation between mastery-approach goals and interest also exhibited variability due to item type, with the average correlation increasing when mastery-approach goals were measured with the PALS and with items that did not use goal-related language (e.g., preference for challenging and interesting tasks). However, even when mastery-approach items were stripped of interest-relevant language, the statistical association between mastery-approach goals and interest remained, suggesting that mastery goal striving may play an important role in interest development (Harackiewicz et al., 2008). The composition of mastery-approach goals has also varied over time (see Figure 2), with measures prior to 2000 tending to include more no-goal items and more recent measures containing more mastery-task and mastery-potential items. In sum, our review revealed that the conceptualization and measurement of mastery-approach goals are much more diverse than has been previously presumed (cf. Donnellan, 2008) and that variations in measurement are associated with differences in outcomes.

Additional Moderators

In addition to these construct measurement differences, there were several additional moderator effects worth noting. Although gender has been hypothesized as a possible moderator of achievement goal effects (e.g., Hyde & Durik, 2005; Middleton, Kaplan, & Midgley, 2004), we found only one such moderator effect. In contrast, grade in school was a significant moderator of five (28%) of the correlations in our review. The grade of the sample is a potentially important moderator as the proponents of the multiple goals perspective (e.g., Harackiewicz, Barron, Pintrich, et al., 2002) tend to study undergraduate students (often enrolled in normatively graded classes). In contrast, the proponents of the mastery goals perspective have used a much wider range of samples, including elementary, middle, and high school students as well as undergraduates (e.g., Midgley et al., 2001). Harackiewicz et al. (1997) noted that performance-approach goals match the more competitive context of college classes, which may explain why they are beneficial for performance. In contrast, Middleton et al. (2004) noted that the context is less competitive in elementary, middle, and high schools and that performance-approach goals may be less adaptive there and potentially harmful.

Despite these compelling arguments regarding grade in school and the effects of performance goals, our analyses did not reveal moderation of the PAp–performance outcome correlation by grade. Instead, we found that as children progress through school, mastery-approach goals become more differentiated from performance goals (the MAp–PAp and MAp–PAv correlations decrease), the avoidance goals become more correlated, and performance-approach goals become less correlated with interest. One of the primary challenges in interpretation of the grade results is that goal measurement is confounded with grade. For example, the finding that performance-approach goals were significantly correlated with performance outcomes when measured with the AGQ but not when measured with any other scale should be interpreted cautiously because 90% of the studies using the AGQ utilized undergraduate samples, compared with 32% of those using the PALS. Although the PALS was administered across a wider range of grades, the number of studies was insufficient to conduct multilevel analyses (e.g., only one study with high school students and six with undergraduates used the PALS and also reported a correlation between performance-approach goals and performance outcomes). However, we can partially address this limitation in the data by using information from multiple sources: Because the grade level of the sample did not significantly moderate the correlation between performance-approach goals and performance outcomes, it is unlikely that grade would moderate the relationship between AGQ/PALS and the performance goal–performance outcome correlation.

Finally, publication status moderated the effects of mastery goals on performance outcomes. Specifically, published studies were more likely to report significantly positive correlations between mastery-approach goals and performance outcomes and negative correlations between mastery-avoidance goals and performance outcomes. In contrast, unpublished studies tended to report null relationships between mastery goals and performance outcomes. The tendency for manuscripts to be published when they report significant, rather than nonsignificant, results is a well-known problem across fields of psychology and in the sciences more generally. This particular bias within the field of achievement goal research may in part reflect the fact that not observing a link between mastery-approach goals and performance outcomes contradicts most theoretical perspectives (cf. Darnon et al., 2009). Similarly, correlations between performance-approach and performance-avoidance goals were higher in unpublished than published studies, perhaps reflecting the theoretical perspective that these two goals are distinct and should not be too highly correlated. Considered together, these findings highlight the important role meta-analysis can play in gaining a more complete understanding of research findings within a field.

Implications for Theory

The lack of construct validity and measurement consistency has clearly muddied the empirical waters of achievement goal research. The variation in achievement goal measurement and the impact of measurement variability on achievement goal–outcome relationships highlighted here have important implications for theory and research. Although the diversity of achievement goal conceptualizations and measurement tools may be indicative of an active research field, one danger is that imprecision in matching conceptual frameworks with measurement tools can produce erratic and confusing patterns of results. Unreliable results can lead to miscommunication as researchers use similar terminology to refer to different underlying constructs, thus fueling controversy and debate.

The mastery goal vs. multiple goal perspectives. Whether there are benefits to pursuing both mastery-approach and performance-approach goals, as opposed to only pursuing mastery-approach goals, has been debated within the achievement goal literature for most of the last decade (Harackiewicz, Barron, Pintrich, et al., 2002; Midgley et al., 2001). Although our review does not fully resolve this debate, it illuminates one source of disagreement among researchers: Some performance-approach scales are positively correlated with performance outcomes (normative), and others are negatively correlated (appearance–evaluative). Given this result, achievement goal researchers can now debate the theoretical and conceptual importance of these aspects of performance goals and conduct further research to examine their separate effects. It is not surprising that both of these components are found in achievement goal researchers' conceptual and operational definitions. After all, both appearance and normative components of performance goals can be found in early conceptualizations of the need for achievement (Murray, 1938) and achievement motive (Atkinson, 1957; McClelland, Atkinson, Clark, & Lowell, 1953). Instead of debating whether appearance or normative components are the "right" aspects of performance goals to be studying, it may be more fruitful to consider the relative impact of each aspect on performance outcomes (e.g., Elliot, Zahn, Maier, & Lichtenfeld, 2008). In the final analysis, our review highlights the possibility that unless achievement goal researchers pay more attention to construct validity, such controversies will remain unresolved even as both sides continue to find empirical support for their own position.

Theory-measurement discrepancy. Theoretical conceptualizations seem so similar in this research area that researchers may adopt a measurement tool without really considering how well it captures the construct that they want to measure. For example, because the PALS and AGQ seem to measure the same achievement goals, researchers may not consider important differences (relative focus on appearance vs. normative-referenced performance goal language, respectively) in how the scales correspond to their theoretical conception of goals. Our review reveals that there are important differences in the components of each type of achievement goal that are captured by different scales. Thus, it is not always easy to match a measurement tool with a conceptual framework in achievement goals research, because the two most commonly used and well-validated scales measure different aspects of the achievement goal construct and in different ways.

Not only do achievement goal researchers need to select measurement instruments that reflect their theoretical perspectives but to develop measures that better represent the various conceptualizations of achievement goals. Until they are developed, researchers are forced to choose between the lesser of two evils: creating custom scales that best represent their constructs (and their hypotheses) but detract from developing a cumulative knowledge base, or using available instruments that provide less construct validity and conceptual clarity. This issue is seen most clearly in the case of appearance and normative performance goals.

Relative independence of achievement goal constructs. Despite the aforementioned measurement differences, our review provides general support for the discriminant and predictive validity of the achievement goal framework. For example, although five of the six overall goal–goal correlations were significantly greater than zero, only one correlation was greater than .30 ($\hat{r}_{PAp–PAv} = .40$), and the pattern of relationships was in the expected direction. In addition, the approach goals were generally positively correlated with adaptive outcomes, and the avoidance goals were negatively correlated, thus providing predictive validity for the bifurcation of approach and avoidance performance goals. However, we cannot make strong conclusions about mastery-avoidance goals, because there were so few studies that measured them and their measures were more likely to assess negative affectivity rather than the theoretical construct of mastery-avoidance goals. Recent empirical work with structural equation modeling has provided mixed support for the 2×2 model (e.g., Baranik, Barron, & Finney, 2007; Easter et al., 2008; Zhou, Murayama, & Nesbit, 2007), and further research is needed in this important area.

Domain generalization. Perhaps because achievement goal theory was developed by educational and developmental psychologists, there has been a natural bias toward conducting research in educational settings. This bias was evident in our review and is the primary reason we are cautious about interpreting the lack of statistical moderation due to achievement domain. There is a substantial body of research on achievement goal theory in other contexts, namely sports (Harwood, Spray, & Keegan, 2008) and industrial/organizational psychology (Payne et al., 2007), but the majority of these studies were excluded from our review because the measurement instruments tend to include items that capture goal-related affect instead of strivings for desired end states (e.g., "I feel most successful when . . ."; Duda & Nicholls, 1992).

Limitations

There are several limitations to this meta-analysis. First, our definition of achievement goal had a specific set of elements—future-focused, cognitive representation, competence-related end state, committed to approach or avoid—and left out other related elements, such as expectancy, specificity, temporal range, degree of consciousness, interconnectedness, complexity, and affect. Although important, these elements were left out in order to create as clear and precise a definition of goal as possible that also connected to the larger psychological literature on goals. Our approach has been an extension of the Payne et al. (2007) meta-analysis of achievement goals. In their review, they used a broader definition of achievement goal whose measures often included goal-related elements (e.g., affect, expectancy) and did not account for variability in item wording. The difference in goal measurement could explain why the Payne et al. review failed to show an overall effect of performance-approach goals on performance. However, an unintended consequence of these differences in goal measurement is that the Payne et al. review predominantly included studies conducted in organizational settings, whose measures tend to contain the appearance component of performance-approach goals, whereas our analysis excluded most of these measures due to our definition of goal and therefore focused more on educational settings. It is unknown whether differences in the meta-analytic results are due to the methodological differences in goal definition and measurement or to the achievement domain. Authors of future meta-analytic reviews could extend our work by systematically testing differences in goal definition (broad vs. precise) and examining the relationships among the many related elements of goal pursuit, achievement goals, and other outcomes.

Second, our meta-analytic review includes only measured goals as contrasted with prior meta-analytic reviews of manipulated goals (Rawsthorne & Elliot, 1999; Utman, 1997). Although those meta-analyses showed that goal valence moderated goal effects such that performance-avoidance goals had negative effects on intrinsic motivation compared with both mastery and performance-approach goals, neither meta-analysis evaluated goal components (i.e., appearance vs. normative) as moderators of manipulated goal effects. In future reviews, researchers could systematically compare manipulated and measured goal effects while taking into account the components of goal manipulations and measures.

Third, many of our moderators were confounded in the literature, making it difficult to interpret them independently. Simultaneous moderator analyses were often not an option as the variables were often perfectly or nearly perfectly confounded, and sample sizes prohibited multilevel analyses. Only more systematic testing using multiple measures across different sub-groups (e.g., grade, ethnicity) will help resolve this issue (cf. Elliot, Conroy, Barron, & Murayama, in press; Middleton et al., 2004).

Fourth, any conclusions regarding mastery-avoidance goals should be interpreted cautiously, particularly for the goal–outcome correlations as sample size was quite small ($k < 10$). Conclusions regarding achievement goal intercorrelations are based on a better sample size ($k > 40$); however, nearly all of the scales include items tapping negative affect or fear, which precludes our drawing any conclusions regarding the theoretical construct of mastery-avoidance goals. Elliot and his colleagues have been diligent in revising their scale to remove the negative affectivity from both types of avoidance goals and thus better align them with the theory, but few of these studies had made it into the literature in time for this meta-analysis (cf. Elliot & Murayama, 2008).

Another limitation of our literature review is that we were only able to include articles published through December 2006. Because of the extensive nature of the coding process and the duration of the review and publication process, we were unable to include more recently published articles. This is of course an inevitable consequence of the scientific process; research marches on while the meta-analyst takes stock of extant research. As a check on the research published since our meta-analysis, we conducted a PsychINFO search of articles published from January 2007 to November 2009; this review yielded 189 abstracts, of which 114 passed our initial criteria for inclusion (i.e., an empirical study in which achievement goals were measured and which was published in a peer-reviewed journal). This suggests that research in this area continues at a lively pace and that there will be more studies to include in the next meta-analysis. As evidenced by this brief review of more recent articles, the field of achievement goal research continues to be productive, and we hope that our meta-analysis has helped to characterize extant research and crystallize issues for future research and theory development.

Summary and Future Directions

Given the theory-measurement discrepancy documented in our review, we strongly urge achievement goal researchers to increase precision when conducting research in several ways. Our systematic review reveals a greater degree of disagreement in how to measure achievement goals than has been previously recognized, and these differences have clear implications for the types of conclusions that researchers make regarding the structure and predictive ability of achievement goals. The gap between theory and measurement may prevent us from accumulating consistent evidence of achievement goal effects, extending the findings to domains outside education, resolving many of the controversies in the field, and producing cumulative results that can be recommended to practitioners. In fact, the lack of theory-measurement consistency may have actually contributed to some of the controversies in the first place. Thus, it is time for achievement goal researchers to do the hard work necessary to define and test our constructs in a precise manner so that meaningful progress can be made.

Ideally, researchers in the field could come to some kind of agreement on how to conceptualize goals from a theoretical point of view and then measure them according to a unified theoretical framework. It may help to remember that the differing conceptualizations of achievement goals had a common origin in the achievement motivation framework and consider that researchers may have gone in different directions without realizing it. However, because the likelihood of consensus occurring in the near-term is probably small, at the very least we suggest that researchers understand—theoretically—what they want to measure, be precise in their explication, and align their measurement instruments accordingly (cf. Hulleman & Senko, 2010). Such alignment may enable researchers to extend our understanding of achievement goal effects and work toward a cumulative motivational science (Pintrich, 2003).

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References marked with an asterisk indicate studies included in the meta-analysis that are discussed in the text. For a complete list, go to http://dx.doi.org/10.1037/a0018947.supp

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